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AMERICAN ANTIQUITY

VOL. V APRIL, 1940 NO. 4

EDITORIAL

NOTES AND NEWS. In this issue Notes and News appears in a very much reduced form. Many persons have expressed pleasure at the larger amount of space devoted to this section in recent numbers, but it was becoming apparent that this department was usurping valuable space that might better be devoted to publishing items of more lasting interest. For this reason the axe has been swung right and left. In an issue when news from most areas is rather less than usual this makes a striking contrast.

With the first number of the next volume, a policy of careful editing will be applied to this department, so that what will be presented will be almost entirely news of a fairly important sort. Personalities, or other less important items may well find a place in the pages of our contemporary, The Teocintli. Most of them had little appeal to a large group of our members, and it seemed unwise to use valuable space for the benefit and interest of the minority.

Preliminary reports of field work, developments of laboratory research, or other news of importance to the great number of students of American archaeology will continue to be reported. It is hoped that major articles will find their way into print more quickly as a result of this policy.

ARCHAEOLOGY IN THE NATIONAL PARK SERVICE

A. R. KELLY[359]

BRIEFLY, the historical background for the legal framework and administrative machinery established for archaeological survey and research in the National Park Service, should be reviewed. The Antiquities Act of 1906[360] and the Historic Sites Act of 1935,[361] the latter growing out of a special study of European and American legislation and precedents for the conservation of historic monuments instituted by the Secretary of the Interior, are particularly important. Also passed in 1935, was an Act to create a National Park Trust Fund which compares with the National Trust of Great Britain; the National Park Trust of the United States grew out of the same studies which found legal expression in the Historic Sites Act of 1935.[362]

More recently, by coöperative agreement, arrangements have been made for the review of archaeological and historical restoration projects carried out under relief auspices; these involve the operative procedures established by the Works Progress Administration, requiring the technical review of all research and survey project applications by the Smithsonian Institution and the National Park Service, Branch of Historic Sites.

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[359] Chief, Archaeologic Sites Division, Branch of Historic Sites, National Park Service.

[360] Antiquities Act of June 8, 1906, entitled "An Act for the perservation of American antiquities . . . "; 34 Stat. 225.

[361] Historic Sites Act of August 21, 1935; 49 Stat. 666, entitled "An Act to provide for the preservation of American sites, buildings, objects and antiquities of national significance and for other purposes."

[362] Act of July 10, 1935; 49 Stat. 477, entitled "An Act to create a National Park Trust Fund Board, and for other purposes." The model for the National Park Trust is found in the National Trust of Great Britain, a private organization established in 1895 which was strengthened by the National Trust Act of 1907, incorporating the pre-existing organization, for the purpose of preserving historic buildings and lands. The governing board of the English Trust is a self-perpetuating body consisting of members and representatives of learned and scientific societies; in the United States, the Board consists of the Secretaries of the Treasury and the Interior and the Director of the National Park Service and two persons appointed by the President for five years each. The purpose of the National Park Trust Fund is very similar to that of the English National Trust and the authority given to receive gifts, estates, to set up corporations and other trusts for the administration of preserved sites and antiquities, is much the same except that the American Act gives greater powers. Pertinent information relative to foreign legislation, including Great Britain, can be found in the comparative "Report to the Secretary of the Interior on the Preservation of Historic Sites and Buildings," prepared by T. Thomas Schneider, in 1935, now in press.

A consideration of the policy of the National Park Service, past and present, toward archaeological research and survey in the areas within its jurisdiction, is in order. Archaeological areas were among the first to be included as national monuments and parks when the National Park Service was established in 1916. Subsequently, extensive land acquisition has resulted in a marked increase in areas which involve either archaeological or historical-archaeological connections, or both. Many of these areas have been transferred from other departments, especially the War Department and the Department of Agriculture. Various institutions, including the Smithsonian, have coöperated in studying the merits of proposed areas, to determine the justification of establishing national monuments and parks.

The policy of the National Park Service in the past has been primarily protective, to hold and conserve important historical and archaeological shrines, with little attempt to do any more research or survey than was necessary or incidental to the primary protective functions. Increased public use and tourist travel have necessitated the physical development of many areas long dormant. Survey is badly needed, in many instances to determine the extent and nature of the archaeological resources to be policed by park rangers and guides. Again, in general, park and monument museum presentation of prehistory require more information and data than is available from existing exploration. Roads, trails, building foundations, drainage, and other construction result in inadvertent uncovering of archaeological materials which require technical attention. Stabilization of walls, rooms, foundations, frequently necessitate some exploration where remains rest on thick midden and other cultural debris. The net result is that however reluctant the National Park Service may be to undertake any extensive archaeological research, the conditions themselves impose a minimum of such work incident to effective preservation and educational presentation to the public.[263]

[263] At Tonto National Monument, Arizona, there is urgent need for stabilizing walls of upper rooms built over several feet of undisturbed cultural debris. Stabilization must begin with foundation structures, which means that the midden must be excavated with scientific investigation. At Aztec Ruins National Monument, Colorado, it will be necessary to clear two rooms and to provide technical archaeological supervision for excavations in the plaza incident to trail preparation and the drainage of the area. At Chaco Canyon National Monument, N. M., stabilization of walls in the ruins of Chetro Ketl and Pueblo Bonito requires archaeological direction. The Chaco, one of the best known and oldest explored areas in the Southwest, is regarded as one of the most advantageous points at which to work out methods of coördinating techniques of field exploration with the problems of structural restoration and stabilization.

Important archaeological and historical-archaeological areas have in some instances achieved national monument or park status with little exploration having been carried out. Others were in the initial stages of investigation when taken over. Ocmulgee National Monument, on the Ocmulgee River, near Macon, Georgia, is an example. Exploration began in the winter of 1933 under Smithsonian sponsorship, continuing through the next four years with local sponsors coöperating with the Works Progress Administration, and lastly became permanent through the National Park Service. At Jamestown, Colonial National Historical Park, and at Yorktown, Virginia, extensive historical and archaeological research has been in progress for some years. The work here involves a variety of historical and archaeological techniques which are related and exhibited educationally through the medium of a temporary museum and laboratory which stresses archaeological method and current field results. It is estimated that a ten-year program is basic to any considered program of out-door exhibits and museum preparation adequate to tell the story of early English colonization. Elsewhere in the United States, several areas, in some instances larger than the state of Rhode Island, have been authorized or are projected for acquisition, which have extensive but unappraised archaeological resources. Accession here grows from a policy of conserving large, unspoiled "primitive areas," considered on scenic grounds or with regard to natural features and scientific resources, including archaeology. The importance of areal survey as a basis for development in these instances is obvious.

The effect of the Historic Sites Act of 1935 has been to place the responsibility for national survey of historic and archaeological sites upon the National Park Service. The objective ultimately is to catalogue and evaluate, on the basis of their scientific importance and urgent need of conservation, all of the historic and archaeological sites in the United States and dependencies. In some cases, public ownership, Federal, state, or local, is required for effective preservation. Otherwise, the designation of particular sites as historic sites, under coöperative agreements made possible by the law of 1935, with voluntary coöperation of landowners and other private or quasi-public societies, will suffice to effect preservation.

Even before the passage of the Historic Sites Act, a beginning was made toward the survey of the more outstanding archaeological sites in the United States whose preservation and public protection was most urgent. In 1934, the Smithsonian Institution, acting in connection with the National Resources Board, circularized the representative institu-

tions and archaeologists of the nation and secured survey data on prepared forms. The cataloguing and evaluation of sites made at that time has been of invaluable assistance to the National Park Service in the few intervening years in appraising the merits of areas proposed for national monument or park status. Since the passage of the Historic Sites Act of 1935, the program of survey and reconnaissance under the Works Progress Administration has gradually been brought into line with the objectives of the Act. Operative procedure as previously described, has found the Smithsonian and the National Park Service acting jointly to stress the importance of site survey, surface collection, type mound and village exploration, topographic and contour mapping, laboratory analysis and comparisons of site materials as an index of site potentialities. Widespread application of the provisions of the Historic Sites Act has been difficult and slow because of inadequate technical personnel and organization.

Under recent reorganization, an archaeological sites division has been set up within the Branch of Historic Sites, in acknowledgment of the growing archaeological responsibilities of the National Park Service. Regionalization of the Park Service administration, with the establishment of four regions in the United States, is another step in reorganization which may lead to more effective regional technical supervision in both history and archaeology. However, no considerable research staff in archaeology is practicable, probable, or desirable in the National Park Service. It must be evident that the technical needs are so great that duplication of functions and staffs must be avoided as much as possible. Yet it is equally apparent that adequate scientific development of the vast archaeological areas under government jurisdiction presents a problem of overwhelming magnitude and it is doubtful if the closest cooperation between government archaeologists and other technicians in the Smithsonian Institution and the National Park Service can alone cope with the task. Moreover, it should be the aim to bring to each developing area, and to each specialized problem of exploration and survey the best informed source of knowledge and technical proficiency, wherever these may be obtained. Frequently, the best authority will be found in the region in which the area exists.

The answer to the problem of national survey is that there must be coördination of survey and research all over the country, looking forward to the conservation, preservation, and deliberated study of particular site situations and developing areas. The participation of not one or two, but of many scientific institutions is indicated. It is recog-

nized that a national survey would require many years to reach completion; what is important now, under the conditions of excellent enabling legislation, prepared on the basis of extended study of both foreign and American models, is to institute a practical working system of cataloguing and evaluating sites. More immediately urgent, however, than the realization of a national catalogue of sites, is the effective use of existing administration and legal machinery, to preserve the outstanding sources of archaeological knowledge and materials.[364]

Archaeological research involving excavations in the Park Service has been held to the minimum necessary to provide scientific data on which physical development of particular areas can proceed. It is important to observe that the problems of the Park Service in this connection are somewhat different from those which ordinarily confront a scientific institution undertaking field exploration. In addition to the collection of scientific data in the field, and the preparation of such data and materials looking forward to publication, the Park Service must consider the preservation of the site, the original context or source of

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[364] Cataloguing devices employed to date are admittedly inadequate, and temporary. The best general summary of the problem, with recommendations for procedure, is to be found in the Report of the Recreation Committee of the National Park Service to the National Resources Board in 1936. Very regrettably, this admirable document has not been made available in published form. The section on "Historical and Archaeological Sites" states the principles involved in a national survey appraisal of sites, stressing conservation as the objective, and provides a tentative scheme or schedule for evaluation. A list of known archaeological sites in the United States, whose preservation or acquisition was urgently recommended, was graded into "A," "B," and "C" classes on the basis of their apparent scientific and historic importance. "A" sites were " . . . selected because of their preëminent significance and because certain of these are faced with imminent destruction through unqualified excavation." " 'A' sites especially designated (s.d.) were recommended for semi-permanent preservation . . ." on the grounds that: (1) under existing conditions of archaeological exploration they might yield only duplicate information; or because, (2) steady archaeological advances in scientific techniques and methods would make them even more important repositories of scientific data than had appeared, or would appear, now—i.e., tree-ring dating has changed evaluations of a number of leading southwestern sites. These "A s.d." sites might thus constitute a special group of "reserved monuments." In connection with this classification, the recommendation was made: " . . . That scientifically valuable archaeological sites on Federal lands not at present within a national park or monument be designated as national monuments and that Federal protection be given the sites so designated; that scientifically valuable archaeological sites on other lands be acquired and added to the monuments; that all archaeological sites which are administered by the Federal Government be classified and treated according to the system of archaeological categories developed herein above, namely 'A,' 'A (s.d.),' 'B,' 'B (s.d.),' 'C,' 'C (s.d.)' . . ."

knowledge *in situ*, with a view to the maintenance of open-air museums and exhibits and the presentation educationally to the American public of the story unfolded on the site. The question of what constitutes adequate scientifically authenticated restoration constantly arises. The tendency to architectural rationalization or idealization must be restrained and subjected to rigorous discipline from archaeological field work and historical documentation which emphasize methods and interpretations of a more precise nature than those which would ordinarily be required for the simple preparation of a scientific monograph based on the study of the "internal evidence" of so many documentary sources. It is not enough, in this instance, to find out *what happened;* it is equally essential to demonstrate the evidences in or on the ground. If, as frequently happens, the evidences of this nature cannot be brought out adequately and exhibited *in situ*, then other means of presenting the information and context must be had. This means, usually, that the park or monument museum must carry the burden of proof in the form of special models, dioramas, and display of objects and sources. In any event, from the preceding it should be apparent that restoration policy and the planning of educational or museum exhibits contemplating the history and prehistory on a particular site must be carried out with a degree of coördination and changing methodology not ordinarily required in field exploration.

The necessity of blueprinting, of preparing historical and archaeological base-sheets, which enter into the master plans of development for different areas just as do the plans and designs for roads, buildings and other engineering constructions, means that the methods and techniques employed in Park Service archaeology need to be varied. Time and space permit of only a few examples of such complex adaptations of present techniques.

Dendrochronology as an aid to both history and archaeology in the eastern United States may be cited. Tree-ring chronology has been demonstrated to be applicable to historical and archaeological contexts in Georgia; it is hoped to continue and complete studies begun on living trees and to begin the identification of archaeological charcoal series taken from an historic trading post site on the Ocmulgee, charred wall posts from the assumed protohistoric Lamar village site, and some 1500 charred beams taken from the prehistoric ceremonial earth lodge on the Macon Plateau. In the same region, at St. Augustine, Florida, well preserved stockade posts secured by archaeological exploration of the moat around Fort Marion are available for study. At Parris Island, South

Carolina, in clearing and landscaping a fortification site of unknown period, 18-inch cedar posts were found in stockade alignment with artifacts and other features indicating much older fortifications, now thought possibly to be the site of 16th century Spanish and French settlement.[365]

In addition to the historical-archaeological situations uncovered at Jamestown, Ocmulgee, St. Augustine, and Parris Island, others should be mentioned as showing the same conditions requiring combined historical, dendrochronological, ethnographical, and archaeological research. Dr. J. R. Swanton's southeastern researches have summarized extant knowledge of the ethnography of tribes in the area and have resulted in descriptions, checked on the ground in many instances, of a number of Indian villages along the Chattahoochee, in both Alabama and Georgia. A quarter of a century of study of the De Soto itinerary has produced a welter of historic-ethnographic presumptive sites which now need archaeological confirmation. The work of the Smithsonian Institution at the Peachtree Mound, Murphy, North Carolina, may mark the inception of such exploration. TVA archaeology in Tennessee has yielded archaeological series which Professor W. S. Webb discusses as *possible Cherokee* and these materials, including numerous house sites, must be compared with other sites in North Carolina, considered to be Cherokee inhabited, which show differing material culture indices, including pottery. In Georgia, the survey of historical and archaeological sites along the course of the Oglethorpe Trail, from Savannah to Augusta, is uncovering other problems, comprising the historic Indian villages of a number of Muskogean tribes, with Silver Bluffs, presumptive De Soto site of Cofitachequi, and Mount Pleasant, historic stamping grounds of the elusive Yuchi, outstanding. The Natchez Trace Parkway, 450 miles long, has a number of historic Indian sites in historic-ethnographic context highlighted by the writings of French soldiers and travellers of the 17th and 18th centuries, with the main interest centering on the Ackia

[365] The following accounts concerning this little-known, but very important site, should be mentioned: Salley, A. S., Introduction to F. M. Hutson's *Prince William's Parish and Plantations*, Richmond, 1935, gives his view of Spanish settlement on Parris Island; also see his conclusions in Appendix C of Mrs. Connor's *Jean Ribault*, Florida Historical Society, 1927. Major George H. Osterhout, Jr., reports on the explorations which uncovered pertinent data in his article, "Three Hundred and Fifty Years"; being the story of "Charles' Fort," built by Jean Ribault in 1562 on what is now known as Parris Island, S. C., in the *Marine Corps Gazette* for June, 1923; also, by G. H. Osterhout, "The Sites of French and Spanish Forts in Port Royal Sound," *Transactions of the Huguenot Society of South Carolina*, No. 141, Charleston, S. C., 1936, pp. 22–35.

Battleground National Monument site near Tupelo, Mississippi (in the midst of Chickasaw Old Fields), and upon several large historic village sites on St. Katherine's Creek near Natchez, Mississippi, shown on comparative study of materials and historical documentation to be Natchez Indian. Fort Raleigh, Roanoke, Ocracoke Island, Cape Hatteras, site of the proposed Cape Hatteras National Seashore Monument, comprise the area of Raleigh's Lost Colony and the neighboring contemporaneous villages described by various English writers and illustrated in the camera drawings of John White. No more promising sites for combined historical, ethnographic and archaeological study could be imagined.

Going further afield, and taking up the subject of 16th, 17th, and 18th century Spanish mission sites, a wide variety of areas has been included in State and National Park development, including the disputed ruins of Santo Domingo State Park in southeast Georgia, numerous mission sites in Texas with the park restoration at Goliad, Tumacacori, and numerous others in the southwest. Whitman Mission in the State of Washington is an interesting 19th century site.

The military history of the United States is well represented in many sites which involve archaeological problems, frequently connected with the ethnography of historic Indian tribes. Fort Ridgely in Minnesota, explored and restored under the technical direction of the National Park Service, is an example of pure historical archaeology requiring a coördination of historical, archaeological, and architectural research. Similarly, Fort Laramie in Wyoming, Fort Abraham Lincoln and Fort Keams in North Dakota, comprising the important historic and protohistoric Mandan Indian villages explored in joint expeditions of Columbia University and the North Dakota Historical Society, represent site explorations involving the so-called "direct historical approach to archaeology." The restoration of entrenchments, redoubts, batteries, magazines, and other military features at the site of the Siege of Yorktown, Virginia, illustrate the combined architectural and archaeological problems involved in such work.

Thus far, emphasis has been put upon the more specialized aspects of research in the Park Service where historical and archaeological problems and methodology are concerned. It must not be overlooked that a vast amount of survey and exploration is needed on park areas in the purely prehistoric field.

It may not be generally known that archaeological areas are among the oldest to come under Federal protection and to have been incorporated into the national park system. Among the older established

archaeological areas, some of which have been set aside for thirty years, are the following:

	Established
Casa Grande Ruin, Arizona (Made National Monument, 1918)	1889
Mesa Verde, Colorado	1906
El Morro, New Mexico	1906
Montezuma Castle, Arizona	1906
Chaco Canyon, New Mexico	1907
Gila Cliff Dwellings, New Mexico	1907
Tonto, Arizona	1907
Tumacacori, Arizona	1908
Gran Quivira, New Mexico	1909
Navajo, Arizona	1909
Walnut Canyon, Arizona	1915
Bandelier, New Mexico	1916

Acquired soon after the establishment of the National Park Service in 1916 are the following: Yucca House, Colorado, in 1919; Hoyenweep, Utah and Colorado, in 1923; Wupatki, Arizona, in 1924. Several of these older established areas comprise extensive territory containing thousands of archaeological sites never surveyed. The urgent need for areal survey, basic to park development, may be noted with particular reference to two of the oldest areas, Chaco Canyon and Mesa Verde.

THE DATES ON ALTAR 5 AT TIKAL

RICHARD C. E. LONG[266]

MR. J. ERIC THOMPSON in his *The Solar Year of the Mayas at Quirigua, Guatemala* (1932) and the late Dr. J. E. Teeple in his *Maya Astronomy* (1930) have very fully developed the theory of determinants in the Maya inscriptions. It is sufficient to recall here that according to the theory a determinant date is one which shows what was the number of days required to correct the shifting Maya year at the date of the inscription in which the date occurs. Thompson has shown that two different bases of correction were used. One was 4 Ahau 8 Cumhu, the starting point of the Long Count, 13 August 3113 B.C., the other was 7-6-0-0-0 11 Ahau 8 Cumhu, 10 September 235 B.C., which is thought by both these writers to have been a probable date for the actual inauguration of the Long Count. Whichever base was used, the correction might be made in either of two ways: (a) by giving a date which at the time of the inscription was the position in the true year which corresponded to the position of 8 Cumhu (or its next following New Year's Day, 0 Pop) at the starting point of the Long Count or at 7-6-0-0-0, according to which base was used, or conversely by giving a date which at the base of correction was the position in the true year of 8 Cumhu or 0 Pop at the date of the inscription; or (b) by giving a date which at the date of the inscription was the position in the true year of the current katun ending date at the base of correction, or conversely a date which at the base of correction, was the date in the true year on which the katun ending fell at the time of the inscription.

Thompson, in the work cited, has elucidated a very large number of determinants at Quirigua and Palenque, and has shown that they also occur at Copan, Yaxchilan and Piedras Negras. It would seem indeed as if the majority of those dates in the inscriptions which are not the ends of periods of the Long Count are determinants. Incidentally this confirms the view of those who hold that the Maya inscriptions contain nothing but astronomical and calendrical matter.

It is the purpose of the present paper to call attention to some determinants at Tikal.

The dates on Altar 5, Tikal, have been deciphered by Dr. S. G. Morley in his *Introduction to the Study of the Maya Hieroglyphs* (1915),

[266] Portarlington, Ireland.

and the following gives his readings, but with the addition of the dates in the Christian era according to the Thompson-Teeple correlation:—

			A.D.
9-12-19-12-9	1 Muluc	2 Muan	28 November 691
9-13-11-6-7	13 Manik	0 Xul	28 May 703
9-13-19-16-6	11 Cimi	19 Mac	1 November 711
9-13-19-16-9	1 Muluc	2 Kankin	4 November 711

He further shows that the last of these dates is 31 days from the date of the adjoining monument, Stela 16, which is:—

9-14-0-0-0	6 Ahau	13 Muan	3 December 711

Now the first thing to be noticed is that 28 November 691 is the date of a new moon, and not only is it that but it is also the terminal day of one of the groups of six lunations. This can be seen by Teeple's book, in which (page 50) the date 9-12-16-7-8 at Copan is marked as a new moon, and as No. 2 of the six month group. The distance from this date to 9-12-19-12-9 is 1181 days, equal to exactly forty lunations, so if the Copan date is moon 2, then this one is moon 42, and, therefore, after dividing by six, moon 6. I should say that I have also, by a different method, calculated that 28 November 691 is a new moon date. Now this date falls within Teeple's period of uniformity during which all the Maya cities reckoned by groups of six lunations which exactly coincided with each other throughout the Old Empire area, so the result is correct. Here one may digress to say that Teeple's table does not show any date at Tikal falling within the period of uniformity, so that the date now under consideration is an interesting confirmation of his thesis.

Now the dates on Altar 5 are, if we consider the Altar itself alone, not fixed in the Long Count, and are rightly fixed in it by Morley by the date of Stela 16. But this Stela is dated by a period ending and there was, therefore, no method of showing the moon's age directly as there would have been if it was dated by an initial series. We now see the reason for giving this date on Altar 5, as it can be regarded as conveying in a somewhat roundabout manner the same information which was usually given by a supplementary series. I think, therefore, that the foregoing considerations are sufficient to take the case out of the region of mere coincidence and to establish that this was the intention of the author of the inscription.

Coming now to the second date in the inscription, 9-13-11-6-7 13 Manik 0 Xul, 28 May 703, it is a determinant of the current katun end-

ing, 9-14-0-0-0 6 Ahau 13 Muan, 3 December 711. The distance from 0 Xul to 13 Muan is 193 days. But the correction needed, according to the Gregorian reckoning, from 3113 B.C., the start of the Long Count, to A.D. 703 would, after casting out all even years of 365 days, be 195 days. So we get the same result as that obtained by Thompson in most of the dates investigated by him, namely that the Maya correction is very nearly, though not quite, as accurate as the Gregorian one.

The next date, 9-13-19-16-6 11 Cimi 19 Mac, 1 November 711 A.D., is not quite so satisfactory, yet it seems also to be a determinant, but in this case, instead of being as usual the determinant of the current katun, it is a determinant of the katun just expired, 9-13-0-0-0 8 Ahau 8 Uo, 18 March 692 A.D. This is a case where the base of correction is the inauguration of the Long Count, not the mythical starting point of it. The distance from 8 Uo to 19 Mac is 231 days. But the correction according to the Gregorian reckoning from 7-6-0-0-0 11 Ahau 8 Cumhu, 10 September 235 B.C. to 711 A.D. would be $230\frac{3}{4}$ days, say 231 days. So in this case the correction amounts to practically the same as the Gregorian one, and it may be accepted that the date was intended to be a determinant. In any case although 9-13-0-0-0 was not the current katun ending for this particular date, it was the current katun ending for the first date in the inscription, 9-12-19-12-9. It is noteworthy that the two determinants in the inscription are calculated from two different bases of reference. Probably this was deliberately done as a check on calculation and it was by using such checks that the Maya attained their remarkably accurate results.

The last date on the Altar is 9-13-19-16-9 1 Muluc 2 Kankin, 4 November 711. It is only three days after the last date, so the Maya author apparently did not think it worth while to put in the distance number as he did with the other dates. It was, however, of great importance from the Maya point of view as it was separated from 9-12-19-12-9 1 Muluc 2 Muan by the distance of 1-0-4-0 on which more will be said further on.

There may be some significance in the unexpressed distance of 31 days from this date to the date of Stela 16 because 31 days is only a little over the length of an average lunation and is within the possible limits of error of a lunar month determined by observation of the first appearance of the new moon, and besides the last date of the Altar and the date of the Stela are near, though not on, the days of full moon. However, I do not think much reliance can be placed on this.

Returning now to the distance 1-0-4-0, it is not, so far as I know, to

be found in any other inscription, but it is very much in evidence in the Dresden Codex. It occurs as one of the steps in four of the ascending series in that Codex, namely on Plates 31*a*–32*a*, 45*a* 62–64, and 70*c*–73*b*. All of them have the period of 1-0-4, the "ritual year" of Förstemann, as one of the steps, this is one 20th of 1-0-4-0. This "ritual year" is also found in Plate 23 of the Codex Peresianus.

The late Professor Robert W. Willson in his *Astronomical Notes on the Maya Codices* (1924) proposed a classification of the ascending series in the Dresden Codex which is of considerable value, by which he allocated each to one of the planets. The first three of the above mentioned ascending series would, under this classification, relate to Jupiter, an attribution which has much to be said in its favor, and the last of them, that on Plates 70*c*–73*b*, to Saturn. This last is perhaps the least convincing part of his classification.

Of the three in the Jupiter set, two start from 13 Akbal with a commencing difference of 4-11, and the third starts from 13 Oc with a commencing difference of 1-0-4, which is four times 4-11. These three series are all clearly related to each other, but the series on Plates 70*c*–73*b* seem quite different, although among its ascending numbers it has 1-0-4-0. It starts from 4 Eb with a commencing difference of 3-5, which is the quarter tonalamatl constantly found in the Codices and has no astronomical significance. Also the astronomical evidence that this ascending series has to do with Saturn is not very strong. However, on the whole it probably does relate to this planet, seeing that the relation of other ascending series to the moon, Venus, and Mars, respectively is certain and to Jupiter is probable, while the two series starting from 9 Ix may relate to Mercury as Förstemann thought, although Willson with less probability attributed them also to Saturn. It would then be highly improbable that this series starting from 4 Eb was the only one without any planetary significance.

Whatever may be the true explanation of these ascending series, it is clear that the number 1-0-4-0 was of much importance to the Maya and one can understand that they were so much impressed by the fact that this important number connected the end of a six moon period with a determinant with an error of only three days and that it was very little over a lunar month from a period ending, that they considered it worthy of commemoration by the altar, the subject of this study.

EVIDENCE FOR THE ANTIQUITY OF SCALPING FROM CENTRAL ILLINOIS

GEORG K. NEUMANN[367]

JUST before the archaeological party of the University of Chicago moved camp to the extreme southeastern part of Fulton County, Illinois, during the summer of 1933, the writer visited the aboriginal site (designated F[v]896 by the archaeological survey) on the Norman Crable farm located on the high Illinois River bluff about two miles north of Bluff City. Here for several years Mr. Glenn McGirr, a local collector, had opened a large number of graves to secure artifacts, and on that afternoon had opened six of them. The burials were extended on the back with the arms to the sides and accompanied by typical Middle Mississippi pottery and other artifacts that were assigned to the Spoon River focus of the Monk's Mound aspect after excavations had been carried on by the field party.[368]

Mr. McGirr was kind enough to let the writer have four of the skeletons for the University collections, and upon cleaning them it was found that one of them, that of an adult male (No. F896-101), exhibited evidences of a violent end, and had cuts on the vault of the skull that seemed to indicate that the individual had been scalped. Death had clearly been caused by four celt blows which had fractured the parietals and crushed in the right side of the skull. If one can judge by the distribution of the cuts, the victim probably had lain face down during the operation for most of the cuts, which look as if they had been made with a flint knife, are on the frontal bone and extend in a rough circle around the crown. After the front end of the scalp had been cut loose in all probability it had been pulled backward and then cut free without making more than two cuts on the occipital bone. The presence of a small amount of calcium carbonate leached from the calcareous loess and deposited in some of the cuts attest to their antiquity.

Here, then, there is direct evidence of a case of scalping of an individual who belonged to a group with a Middle Mississippi culture that was shown in Illinois to be pre-historic and by relative chronology to post-date Hopewellian manifestations. All evidences of culture, as well as of physical anthropology, point to the Muskhogean-speaking tribes of the Southeast, who, it may be noted, also practiced scalping when De Soto first visited them in 1540.

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[367] Museum of Anthropology, University of Michigan.

[368] For descriptions of sites of this focus see Cole, F.-C. and Thorne Deuel, *Rediscovering Illinois*, Chicago: University of Chicago Press, 1937.

Friederici[369] has pointed out that throughout most of America the earlier type of trophy was the head itself, an observation that has been substantiated by the finding of trophy skulls with Hopewellian burials, as in mound 16 of the Turner group. Willoughby[370] mentions that thirteen of the trophy skulls have superficial scratches or cuts on their surface, apparently made with flint knives in the process of removing the flesh, but there seems to be no definite evidence for scalping in the strict sense. Similarly, Shetrone[371] refers to a trophy skull from the Hopewell mound proper which shows numerous marks of a flint knife. These cuts go around the skull, circumscribing an area as if the scalp had been removed, but there are other cuts due to cleaning too. Very few of these are within the circumscribed area, nevertheless these cuts, as well as the fact that they were on the trophy skull, make this a questionable case. It may be of interest in this connection that the victims of the operation both in case of the head trophies and the scalping from site F^{v}896 represent individuals of the same physical type as the other burials of the respective populations. The only other case of direct evidence for scalping that the writer has encountered was in a skull from the Madisonville cemetery, a Fort Ancient aspect site that shows White contact and, therefore, does not indicate any antiquity as far as scalping is concerned.

Scalping, according to the researches of Friederici,[372] was confined originally in North America to a limited area in the eastern United States, and was most fully developed among the Muskhogean and Timucuan-speaking tribes. The custom extended all over the territory of the present Gulf states, on both sides of the Mississippi, among the Natchez and Tunican tribes, and farther on to the Caddo of Texas.[373] Towards the north, the Hurons and other Iroquois practiced scalping,

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[369] Friederici, Georg. *Skalpieren und ähnliche Kriegsgebräuche in Amerika.* Inaugural-Dissertation zur Erlangung der Doktorwürde der Philosophischen Fakultät der Universität Leipzig. Braunschweig: Friedrich Vieweg und Sohn, 1906, 172 pp.

[370] Willoughby, C. C. *The Turner Group of Earthworks, Hamilton County, Ohio.* Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, vol. VIII, no. 3, 1922, p. 61.

[371] Shetrone, H. C. *The Mound Builders.* New York: D. Appleton and Co., 1930, p. 103.

[372] In addition to the reference cited above see also: *Skalpieren in Nordamerika. Globus,* vol. 73, no. 13, April 2, 1898, pp. 201–207, and no. 14, April 9, 1898, pp. 222–228, Braunschweig; and *Scalping in America.* Annual Report of the Smithsonian Institution for 1906, pp. 423–438. Washington: Government Printing Office, 1907.

[373] Friederici, 1907, p. 428.

Five views of the skull from F-896, showing scalping cuts.

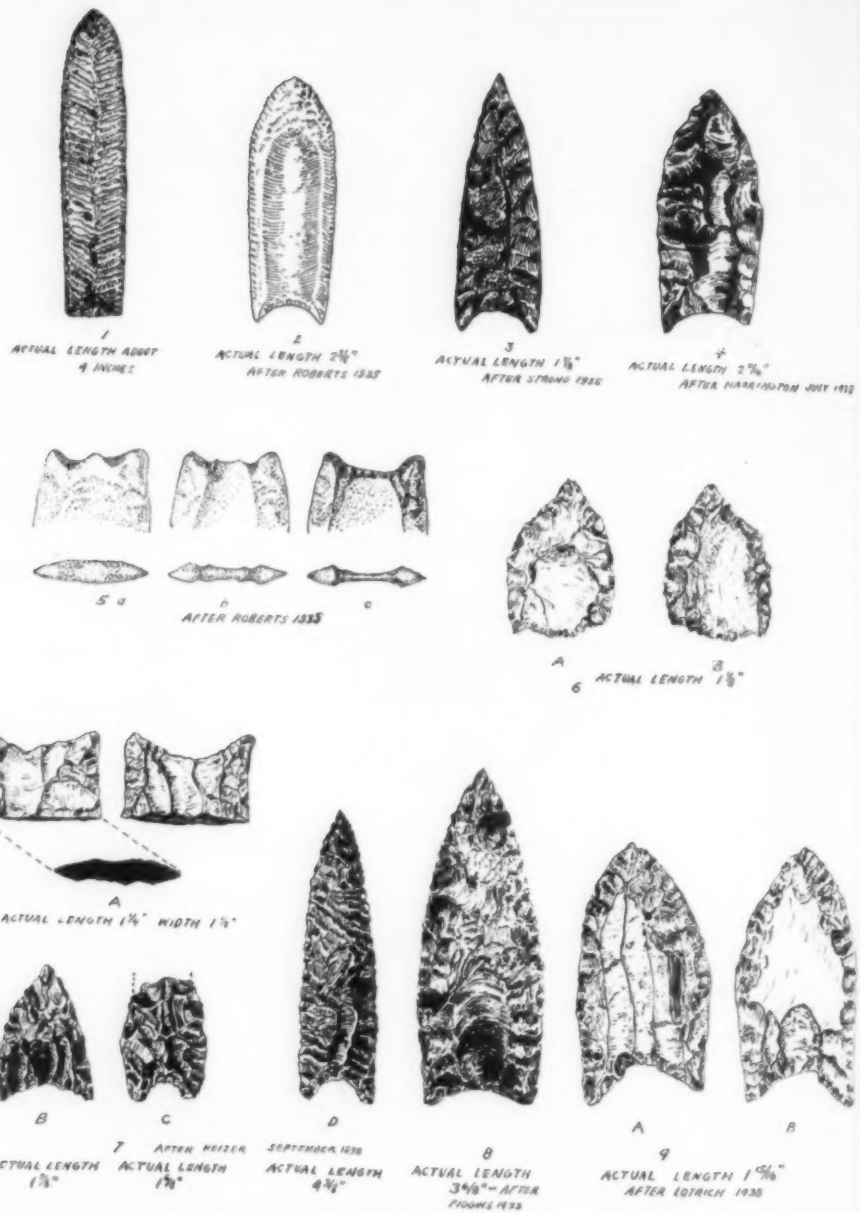

FIG. 13.—Types of chipped points, for comparison.

and it is suggested that they may have acquired the custom through the Cherokee, Tuscarora, and Susquehannock.

The Algonkian tribes on the lower St. Lawrence, in New Brunswick, Nova Scotia, northern Maine, along the Delaware and Chesapeake bays, down to Carolina also practiced scalping at the time of the advent of the Whites, while the Algonkian tribes who were settled in New England, eastern New York along the Hudson, as far as New Jersey were head-takers only. Among the central Algonkians as well as their relatives of the Plains, the Blackfoot, Cheyenne, and Arapaho, the custom of scalping was found fully developed when they came in contact with the Whites, but this was much later.[374]

Lederer reports having observed the practice between 1669 and 1670 among the Siouan-speaking Wateree of South Carolina,[375] but it was unknown until comparatively recent times among the Siouan-speaking tribes of the Plains, that is, it was quite common at the time the Whites came in contact with them, although it is of a later development than among the Muskhogean and Iroquois-speaking tribes.[376] Finally, the greatest impetus to the spread of the scalping practice was a direct result of the encouragement in the shape of scalp bounties offered by the colonial and later governments.

In conclusion one may say that Friederici demonstrated that scalping was practiced in the eastern United States at the time of the first White contact. The case of the skull from Fulton County, Illinois, carries the practice back into pre-historic times in a Middle Mississippi manifestation with which no White trade material has been reported to date, and the trophy skulls of the Hopewellian manifestations seem to substantiate Friederici's assumption that head-taking antedates the practice of scalping proper.

[374] *Ibid.*

[375] Friederici, 1898, p. 203.

[376] Friederici, 1907, p. 429.

FOLSOM AND NEPESTA POINTS

CHARLES SCOGGIN[377]

THE reported occurrence of Folsom points in California,[378] and the suggestion that the parts of the Folsom complex will be found to be as generally widespread west of the Rocky Mountains as they have to the eastward, raises several interesting problems as to the relative age and significance of Folsom material reported from different parts of North America. It becomes obvious, moreover, that an appreciable time has been involved in the spread of the complex if its limits are to be extended, as recent occurrences would suggest.

These and other considerations properly belong to a survey article, and it is enough for the purpose of this paper to mention briefly that during the past several years the Folsom complex has occupied a singular place in any postulated chronological scheme for American archaeology because investigation during this time has failed to show what lies immediately on either side of it. Various deposits have contributed parts to a study of the early history of man in America, but they have not been capable of being readily placed in any tentative outline of that history. Consequently, it has been impossible to say what the Folsom complex developed from and what it was into which it merged.

There was a suggestion, based solely on typology, that the Yuma type of artifact (Fig. 13, 1) preceded the Folsom type (Fig. 13, 2),[379] but passing over a comparison of the technique of stone-flaking represented in the two, which appears to admit of considerable discussion, it can be said that at a principle Folsom campsite in the Plains area, points which have been called the Yuma type actually appeared later than the Folsom type.[380] Yet even with this evidence the picture does not become clear as to what group followed the early group of hunters, since the significance of the Yuma type in the study of early man is yet to be shown. There is some indication of antiquity for the particular type,

[377] Julesburg, Colorado. [378] Harrington, M. R., 1938*a* and 1938*b*.

[379] Renaud, E. B., 1932, *Idem*, 1934.

[380] Roberts, F. H. H., 1936, p. 22 and p. 29.

Cotter, J. L., 1937*a*, mentions three basal fragments of Yuma points and a fourth "technically . . . Yuma" in a deposit excavated by the Colorado Museum of Natural History at the Lindenmeier site in 1935; the position of these points in relation to the Folsom material is not stated definitely. The present writer believes that the subsequent work at the site by the Bureau of American Ethnology, as yet unpublished by Roberts, has indicated the true significance of the material in the area where the trench of the Colorado Museum was located. See, also, Roberts, F. H. H., 1936, p. 22.

but it cannot be stated with any good foundation in fact whether it is an identifying feature of a complex of its own or whether it belongs to one or several complexes. The principal sites purporting its antiquity have contained associated material that either indicates mixed deposits or establishes contemporaneousness of the type with other types.[381]

One notable early horizon to which attention has been directed as having a seeming affiliation with the Folsom complex is the lowest level of occupation uncovered at Signal Butte, a stratified site in western Nebraska,[382] where the leaf shape of the predominating point (Fig. 13, 3) has suggested, to a number of students, the general pattern of the Folsom point. But a leaf-shaped pattern is not enough to establish a connecting link between the two stages, nor is that the only feature upon which the resemblance seems to be indicated, but the Signal Butte I point, itself, is enough to refute a connection, as becomes evident when it is examined. It is much more than a Folsom point without the spalls removed, for its thick body bears little resemblance to that of the projectile point which may be reconstructed by fitting channel flakes into their proper place on the fluted faces of the true Folsom point.[383] In addition, the absence of any important faunal similarity between the lowest level at Signal Butte and the principal sites with which the Folsom point is identified—the deposit near Folsom, for instance, or Burnet Cave, the Lindenmeier site, or the beds near Clovis—is good indication that the time interval between the Folsom complex and the aspect in the lowest level of the butte near Scottsbluff is considerable.

That something in the way of an aspect or another complex both preceded and followed the activities of "Folsom Man" appears almost certain, but no satisfactory explanation as to what they were has been available since the original discoveries were made during the middle of the last decade at the type site in northeastern New Mexico.

With this in mind, the reports of the occurrence of typical parts of the Folsom complex, including, especially, typical Folsom points, in California, become of importance if the finds actually are component

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[381] Bell, E. H. and Van Royen, W., April, 1934, on the Spring Creek deposit excavated by C. Bertrand Schultz, 1932 (for critical evaluations of this deposit see Strong, 1935, pp. 221–222 and, especially, p. 281; and Figgins, 1934, p. 4 and p. 5); Cook, H. J., 1931 (see Figgins, 1934, p. 2); Cotter, J. L., 1937*a* (see Roberts, 1938) and 1937*b*; Howard, E. B., 1935.

[382] Strong, W. D., 1935, pp. 224–239; p. 279.

[383] Compare points under *o*, Plate 25, part 1, Strong, W. D., 1935, with Folsom points and channel flakes, Roberts, F. H. H., Plates 4, 5, 6, 7, and 8, 1935, and Plate 4, 1936.

parts in the problem, for the Folsom material is reported to occur *above* several other artifact-bearing levels which, because of position and typological features are thought to be older than the level ascribed to "Folsom Man."[384] It is not the purpose of this paper to discuss the whole of the California deposit, though it is hoped that the reports which may be forthcoming concerning the place go into rather exhaustive detail to explain the geological features of the site; otherwise, the unusual occurrences of artifacts within the deposit, and especially the apparent absence of any faunal association normal in undisturbed camping sites, becomes unconvincing.

There are certain characteristics, however, of the so-called typical Folsom points from the Borax Lake site in California that may be pointed out as significant when compared with other stone projectile points from certain parts of the United States.

It immediately becomes obvious when the comparison is made that, although descriptive material available on the points themselves is meager, there is enough to indicate that thus far no point has been recovered from the site in California which by any extension of terminology can be called typical Folsom. The writer is aware that such a statement is in direct variance to what has been said of the points in the brief reports of the material from the Borax Lake site, but he thinks that the best illustration of a point presumably typical of those called "Folsom" from that place indicates the error (Fig. 13, 4).[385] Beyond a superficial resemblance, which goes no further than the general leaf-shaped outline, the point seems to be typical of a kind where thinning of the base has been exaggerated by the removal of one or more thin flakes resulting in a fluted appearance. But this manner of fluting is not comparable to the fluting on the true Folsom point (compare Fig. 13, 2 and 4). There is, in fact, clear indication that the two different results were accomplished by two different means, and inasmuch as there seems to be an understanding that the mere presence of a "groove," not the nature of the flute, is enough to justify the application of the term "Folsom" to any point, a distinction seems necessary.

In the true Folsom point, the removal of the spall was accomplished by applying the necessary percussion upon a "nubbin" situated between the lateral points of the base (Fig. 13, 5*a*). The technique of the manu-

[384] Harrington, M. R., 1938*b*.

[385] Harrington, M. R., July, 1938, p. 135. One point; one view. As far as the writer is aware this is the only point illustrated in print and is presumably a good example of the ones called typical Folsom.

facture of the Folsom point has been adequately described elsewhere, for excavation at a typically Folsom campsite has shown that this "nubbin" was an integral part of the point at one stage in the flaking.[386] In the completed point, traces of this feature were often worked out by secondary retouch along the basal concavity (Fig. 13, 5*c* and 2); in other examples of the finished artifact it may be clearly seen.[387]

There is no indication of such a technique evident in the point from Borax Lake. The fact that the principal large flake removed from the face has left its scar well towards one side of the concavity indicates that no "nubbin" was carefully left there to receive the impact necessary to remove a true spall, or channel flake. There is, on the contrary, good reason to believe that the large flake and two smaller ones adjacent were removed by applying pressure, not percussion, to the base in the same manner as that in which flakes were taken from across the face by the application of pressure upon either edge. It appears that the extension of the large flake running from the base was accomplished by at least two additional actions. And there is a suggestion that this manner of thinning the base was one of the minor techniques in stone-flaking used by the people at the Borax Lake site, since other types of points, such as the Pinto Basin, aberrant forms, "a few small arrow points . . . , bright and new looking, for which the modern Pomo Indians were probably responsible"[388] and also a Gypsum Cave type,[389] occur at the same level.

Although the illustration of the point from Borax Lake is of one face only, and hence precludes an examination of the other side, it may be mentioned as a matter of interest that there is always a possibility that what may be called a Folsom or Folsom-like point is actually a point fashioned from a flake which had a spall removed from one of its surfaces previous to its utilization by an Indian. When a flake of this kind is used, there results a completed point which is "fluted" on one of the faces; or the original flake may be of such a nature as to give rise to a completed point with two fairly good flutes, one on either face. The writer has in his possession such a point, from a site probably comparable in age to the top level at Signal Butte, which is a good example of what happens when a flake, unintentionally fluted, is used for the shaping of a projectile point or any artifact (Fig. 13, 6). The one in question may have been intended for something other than a point,

[386] Roberts, F. H. H., 1935, pp. 19–20.
[387] *Ibid.*, Plates 5, 6, 7, and 8; 1936, Plate 4.
[388] Harrington, M. R., 1938*a*, pp. 135, 136.
[389] *Idem*, 1938*b*, p. 173.

but on several occasions it has been called a "Folsom point" by persons who did not first examine it closely. It appears that its shape and the shape of leaf-shaped points like it, has resulted from the natural tendency there would be to work out a point around the unintentional flutes, or flute, on the flake. Whether the craftsman realized the advantage of the double concavity of the point as an aid to hafting, is debatable; at any rate, a point of a general leaf-shape usually would result.

It may or may not be shown that the so-called Folsom points from California can be explained thus. An important thing is that from available information, these particular points are strikingly similar to twenty-five other points, one of which has been called Folsom-type (Fig. 13, 7*A*), and comprising three other general patterns, from the Sacramento Valley in the same state (Fig. 13, 7*A*, 7*B*, 7*C* and 7*D*).[390]

In general it may be said that these points, from these two different localities in California, possess certain characteristics of the Folsom point, if only in shape or a fluted appearance. The consensus of opinion among students today has tended towards an abandoning of the terms Folsom-like and Folsomoid, since loose terminology admits of too many variations and in certain instances has allowed investigators to see Folsom-like or Folsomoid characteristics in almost any point they chose. It is also true that the points described as belonging to the subordinate type almost invariably creep into the literature at one time or another as being Folsom points. The designation of the particular points from the Borax Lake site and the Sacramento Valley as being Folsom-like, not typical Folsom or Folsom-type, would probably meet with a general approval, but even this designation would be inaccurate, for the writer wishes to point out that they apparently possess characteristics which are more or less identical with a type of point from Colorado which had been found and described sometime previous to the California finds by Mr. Victor F. Lotrich, Curator of Archaeology and Ethnology at the State Historical Society of Colorado.[391] The type has been called *Nepesta* (Fig. 13, 9).

It is the evident similarity between these particular California points and the Nepesta type which seemed to indicate a need for this paper.

The point described by Mr. Lotrich is a complete one and is a striking example of the kind where long, thin flakes have been removed down across the face from the base. These flakes have been taken from

[390] Heizer, R. F., 1938. [391] Lotrich, V. F., 1938.

both faces. The indication here, as in the points from the west coast area, is that the technique involved is different from the one used in the fashioning of the distinguishing feature of the Folsom point. The Nepesta point on one face "in place of a single channel groove . . . has three longitudinal grooves running almost to the tip. These were not taken off as a continuous flake but as a result of several flakings. Upon the reverse side (heavily coated with patina) there are two grooves running toward the base, while the rest of the face is as it originally was as a spall. The marginal retouching is not as fine as on the [Folsom point], it being more irregular, notably as to the size of the flakes taken off."[392] When the points from California are compared with the point described by Mr. Lotrich it appears that they resemble the Nepesta type sufficiently to remove them from the Folsom category.

At present there is no good clue to the respective or relative age of these points, but it is curious that they occur in Colorado and at the Borax Lake site and in the Sacramento Valley under somewhat similar circumstances. In California, the occurrence of the points, to date, proves no great age. The type point came from eastern Colorado and was found in the bed of a gully, five feet below the present surface. "The sand in this area (of Colorado, where the point was found) had been completely blown away and the hardpan underneath had eroded in gullies by the action of wind and water. The point then may have come from somewhere along these five feet of ground, so any conclusion here would have to be very general, as about the only fact we have is its location in the gully, the type of point itself, and the condition it is in."[393] Altogether, it must be said that thus far no occurrence of the Nepesta point indicates an antiquity comparable to that of the Folsom type, though future investigation may invest it with considerable age.

In the deposit near Dent, Colorado,[394] and more particularly those near Clovis, New Mexico,[395] large points have been found which at a first glance suggest some resemblance to the Nepesta type (Fig. 13, 8). But here, even as with the better examples of Folsom points, the resemblance becomes only a superficial one. There is good indication of strong percussion; actually, the width and length of the flute on each point appears small because of its comparison to the points as a whole.[396] They have been termed Folsom[397] and Folsom-like[398] but they seem to

[392] *Ibid.*, p. 16. [393] Lotrich, V. F., in a letter to the writer, February 24, 1939.
[394] Figgins, J. D., 1933. [395] Howard, E. B., 1935; Cotter, J. L., 1937*b*.
[396] See Figgins, J. D., 1933; Plate 1; Cotter, J. L., 1937*b*, Plate 3, Figs. 1 and 2.
[397] Figgins, J. D., 1933, p. 5. [398] Cotter, J. L., 1937*b*, p. 11.

fall well within the definition of a Folsom point as agreed upon at the Symposium on Early Man held not long ago in Philadelphia[399] and can, therefore, be excluded from any other type at present recognized.

There is nothing to show the Nepesta type to be worthy of any recognition such as attended the certain occurrences of the Folsom point; it may be only one of numerous and insignificant variations among projectile points, as are provided for under numerous classifications. In the particular instance, however, the Nepesta seems to serve a good purpose. The writer would regret the confusion that might result from the declaration of special names to identify the many different kinds of artifacts from wide spread areas in North America; it is probably true, for instance, that the California investigators have not previously been aware of the Nepesta type point. But, as concerns the careless application of the term "Folsom" to projectile points, it would appear that where present terminology does not seem to admit of adequate descriptive terms, more accurate means must be employed if students are to know exactly what is meant when a certain term appears in the literature. This, in fact, was the incentive for the declaration of this particular type from Colorado.[400]

From available information, then, it would seem that the so-called Folsom and Folsom-like points from the Borax Lake site, and the points described from the Sacramento Valley, and any other points previously described which bear characteristics like theirs, should henceforth be referred to as Nepesta or Nepesta-like, not Folsom or Folsom-like. Observance of the laws of simple classification and the rules of priority make this distinguishing necessary. It is advisable to suggest that students would be wise to avoid any use of the term "Folsom," with or without the modifying adjective "like," when speaking of certain projectile points *unless* there is an urgent need for doing so. A proper study of New World archaeology can thereby be aided.

This would make clear that what is meant by Nepesta is not the true-Folsom. And, since the Folsom point remains the identifying feature of the material ascribed to "Folsom Man," it in turn suggests, by proper extension of the term Nepesta to the California finds, that a case for the presence of the Folsom complex has yet to be established west of the Rocky Mountains.

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[399] Howard, E. B., 1937.

[400] Lotrich, V. F., 1938, p. 17.

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ARCHAEOLOGICAL INVESTIGATION IN CENTRAL ALASKA

FROELICH RAINEY[401]

THE area referred to in the following summary of investigations[402] includes the valley of the Tanana River, sections of the Central Yukon Valley above the mouth of the Tanana, and the upper Copper River Valley. This sub-arctic region, inhabited by bands of semi-nomadic Athapascan Indians, by white traders, trappers, miners, and only recently by a few farmers, presents unusual difficulties to an attempt to discover archaeological sites. This is due not only to the sparse population and limited cultivation but to the characteristic mantle of moss, brush and forest that obscures all evidence of ancient dwelling sites. No habitable caves or rock shelters have been found. Under these circumstances, investigations must depend primarily upon information obtained from the present natives and upon accidental discoveries made by white settlers in very limited cultivation and in placer mining operations.

Through inquiry at all the native settlements in the area we have succeeded in locating numerous old dwelling sites remembered or accidentally discovered by the natives. The majority of such sites may be classed as semi-permanent fishing camps marked by rectangular bark-house depressions and small refuse middens. They occur on small clear-water tributary streams rather than upon the banks of the great, swift, muddy, glacial rivers, a condition which can be explained by the fact that fish are the one dependable food supply of these people and that fish could be taken most easily in the small, clear streams before the introduction of the modern fish wheel made it possible to take large numbers of salmon in the main, turbid rivers. This circumstance undoubtedly affected the earliest inhabitants as well as the historic Athapascan Indians, since their food quest presumably presented the same problem, and it suggests that evidence of early migration must be sought not along the banks of the great rivers, but inland, on clear streams or lakes and upon high ridges which remain at present the routes of travel both for natives and for the game they follow.

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[402] The investigations were carried out with funds supplied by the American Museum of Natural History in New York (Voss Fund) through an arrangement with the University of Alaska, College, Alaska, during 1936 and 1937. A more detailed account by the writer, entitled "Archaeology in Central Alaska" appears in the Anthropological Papers of the American Museum, Vol. XXXVI, 1939.

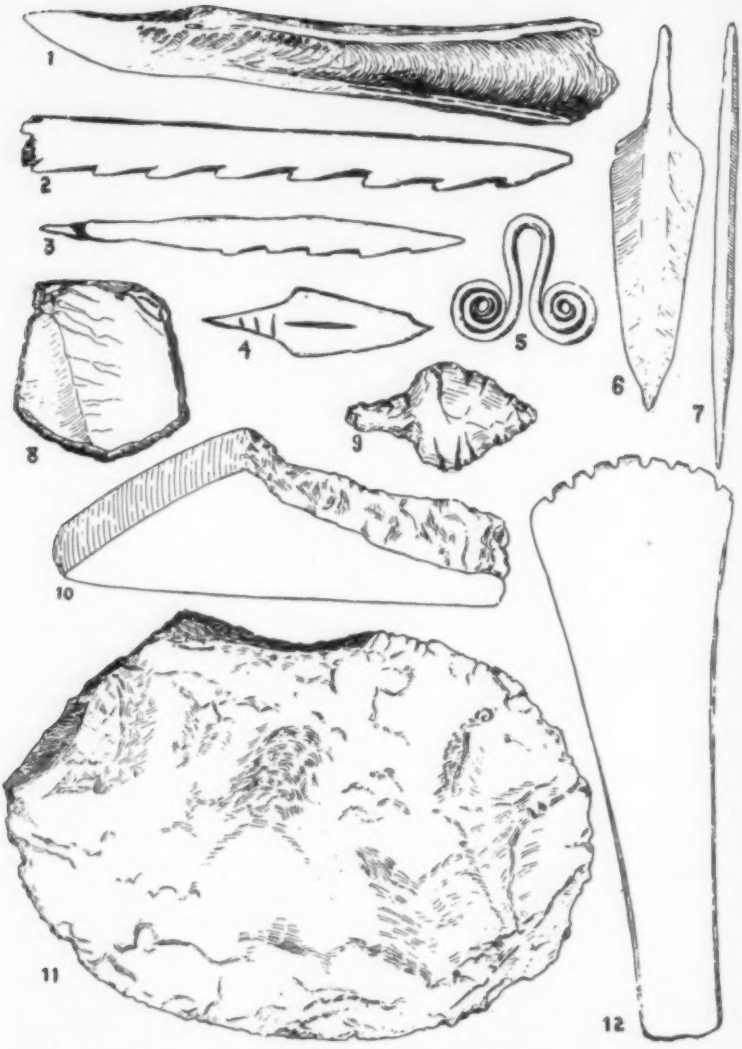

FIG. 14.—Implements excavated at Dixthada, old Athapascan fishing-camp site, upper Tanana Valley. 1. Bone Knife; 2–3. Fish spear barbs; 4. Horn arrow point; 5. Copper ear ornament; 6. Copper arrow head; 7. Copper awl; 8. Flint end-scraper; 9. Flint arrow head; 10. Rubbed stone adze; 11. "Tci-tho," stone skin scraper; 12. Copper skin scraper. (Natural size except No. 1 which is ½ size.)

Numerous fishing-camp sites in the upper Tanana and Copper River valleys have been excavated, now making it possible to define in part the complex of traits characterizing an inland culture, not directly influenced by the Eskimo culture of the coast and the lower Yukon Valley. Most of the sites contain very few artifacts and cannot be associated specifically with historic Athapascans, but one site in the upper Tanana Valley, representing a long and more or less continuous occupation establishes a connection between historic and pre-historic Athapascan material culture. This site, known as Dixthada, is on Mansfield Creek near the present Mansfield Village. A series of ten refuse middens can be graded in age from those at the south end of the site, abandoned only twenty years ago, to those at the north end, abandoned long before any contact with European culture. Some slight changes in material culture are indicated, but the material as a whole can be referred to historic Athapascans and their ancestors. Briefly, the collections from this site include the following: hammered native copper arrow and spear points, awls or needles, skin scrapers, ear and nose ornaments; crude stone skin scrapers,[403] whetstones, rubbed stone adzes, very small stone arrow points (stemmed), blades with bilateral retouching, scrapers with unilateral retouching, end-scrapers, retouched flakes, polyhedral cores and small prismatic flakes struck from these cores; bone and horn stemmed arrow points, barbed or notched bone points probably used on multipronged fish spears, bone knives, scrapers, awls, and a few unidentified fragments rarely engraved with simple patterns. Cut birch-bark fragments and numerous burned stones indicate cooking was done in birch-bark baskets. No pottery was found at this site nor at any of the numerous sites investigated in the Upper Tanana and Copper River Valleys.

Pottery was excavated, however, in small hearths and refuse pits at the site below Rampart Rapids on the Yukon River, thirty-five miles above the mouth of the Tanana.[404] A few sherds have also been found

[403] These scrapers, called *tci-tho* in the upper Copper River Valley, are made and used in preference to iron blades at present, both in that region and in the Upper Tanana, for scraping skins. It is the most common implement in all Athapascan sites excavated. An oval or semi-lunar flake is struck from a water worn boulder and then battered against a stone until crudely retouched. The same implement is reported by Hrdlička from the lower Yukon; also by de Laguna from the lower Yukon and Cook Inlet. The implement also occurs in collections from the Baikal region in Siberia.

[404] Potsherds found at the mouth of the Tanana are reported by Frederica de Laguna "An Archaeological Reconnaissance of the middle and lower Yukon Valley, Alaska." AMERICAN ANTIQUITY, Vol. II, pp. 6–12.

at the Agricultural Experiment Station near Rampart, forty miles above this point. A single sherd was also found in a field near Fairbanks in the Tanana Valley, two hundred and fifty miles by this river above its junction with the Yukon. Natives on the lower Tanana and central Yukon inform me that their ancestors made pottery near Rampart Rapids where they had found a deposit of suitable clay. Chief Matthew took me to a number of pits excavated to this clay stratum through three to four feet of surface soil. These pits are on the banks of the Yukon across the river from the hearths containing potsherds. I was further informed by the natives that pottery, made on the Yukon, was traded some four hundred and fifty miles up the Tanana as far as the mouth of the Delta River. At present, it appears that pottery was made by the historic Athapascans in the Yukon Valley as far inland as Rampart Rapids and that it was apparently traded some distance up both rivers above this point. However, this must remain merely a tentative conclusion, since no excavations have been carried out in the upper Yukon Valley.

In spite of the almost negligible amount of cultivation in central Alaska, a surprising number of artifacts have been found and reported to the University. Many of these artifacts can now be referred to a recent Athapascan culture, since we have defined it in part through the excavation of old Athapascan dwelling sites. However, there is a class of flaked stone implements, associated with at least three accidentally discovered sites, which at present appears to represent a different type of stone industry. This class of material was first discovered in a site on the University of Alaska campus in 1933. It was excavated by Mr. John Dorsh, later by the writer. The first collection excavated was described briefly by Dr. N. C. Nelson[405] who observed that certain implements classed as end scrapers, semi-polyhedral cores and small prismatic flakes struck from these cores are characteristic of pre-neolithic collections from the Gobi in Mongolia. He further observed that a definite similarity in the preparation process suggests specific proof of cultural relations between Asia and America. In a recent examination of epipaleolithic and neolithic material from the Lake Baikal region in Siberia, now in the museums of Moscow and Leningrad, I recognized not only the specific scrapers, cores and flakes, but also practically all the characteristic implements from the University of Alaska site. The Alaska

[405] Nelson, N. C. "Early Migration of Man to America" *Natural History*, Vol. 35, p. 356, N. Y. 1935) "Notes on Cultural Relations between Asia and America"—AMERICAN ANTIQUITY, Vol. II, pp. 267–272.

FIG. 15.—Implements excavated at the University of Alaska Campus Site, Tanana Valley. 1. Semi-polyhedral core; 2–6. Prismatic flakes struck from prepared cores; 7. Flint blade; 8. Obsidian blade; 9. End-scraper; 10, Side-scraper, retouched from one face only; 11. Turtle-backed blade, retouched from one face only. (Natural size.)

material does not correlate with any one of the particular epi-paleolithic and neolithic cultures isolated in the Baikal regions,[406] and conclusive comparison between Alaskan and Asiatic material can not be made, since the Alaska collections do not compare in size and since the vast intervening region of northeastern Siberia is practically unknown archaeologically. The striking similarities in certain types of implements undoubtedly indicate some cultural connection, but whether the material is contemporaneous and whether it is evidence of migration can only be determined by further work in the intervening inland regions both in Siberia and in Alaska.

The campus site and the two sites which appear to be related to it produced only flaked stone implements without any other cultural refuse[407] and their age can be determined only through correlation with other sites. It may be that further investigation will make it possible to associate these sites with the historic Athapascan people, since the small end scrapers now are known to be one of the most typical implements in the Athapascan site (Dixthada) of the upper Tanana. The more significant cores and flakes have also been found in the Dixthada site, but in very small numbers, while they are the most common types of implement in the University campus site. Other implements from the campus site such as finely chipped blades and certain side scrapers do not occur in Athapascan sites. With the absence of bone, horn and copper implements as well as rubbed or polished stone tools, and with a small flint industry representing a different chipping process, these sites have been considered more ancient than Athapascan culture as now known, and suggestive of an early cultural relation between Asia and America.

Artifacts in association with late Pleistocene mammal remains, unearthed by placer mining operations in central Alaska were reported as early as 1933 but the scarcity of recognizable artifacts found and the circumstances of their discovery caused little significance to be attached to the finds. During the past three years, however, through the increase in mining activity and more careful observation, numerous implements have been found in late Pleistocene fossil-bearing deposits, indicating that men were contemporary with extinct mammals in the Tanana Valley.

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[406] Debets, G. "An Experiment in Isolating Culture Complexes of the Baikal Neolithic" (in Russian) *Izvestia of the Association of Institutes for Scientific Research.* Vol. III No. 2, U.S.S.R. 1930.

[407] Similar material is found under the same circumstances in the Gobi and in the Lake Baikal region.

Wide cuts, often several miles in length and sometimes as much as 140 feet in depth are now being sluiced out along stream valleys tributary to the Tanana in the Fairbanks District. In order to reach gold-bearing gravel beds an over-burden of frozen silt or "muck" is removed with hydraulic giants. This "muck" contains enormous numbers of frozen bones of extinct mammals such as the mammoth, mastodon, super-bison and horse, as well as brush, stumps, moss and fresh-water mollusks. With the possible exception of two species, the identified plant remains belong to living genera,[408] but because of the extinct mammal bones, the "muck" is generally believed to be late Pleistocene or early post-glacial.[409] No adequate explanation of the age of these deposits nor the manner in which they were formed can be given at present. Tree-ring studies recently carried out by J. L. Giddings, Jr.[410] for the Frick laboratories in the American Museum suggest that the process of deposition as well as the actual age of the muck may be determined by this method. Utilizing stumps found at different levels in the muck, he has determined that some 15 to 20 feet of muck were deposited in Engineer Creek during a period of 307 years. A terminal date for this formation may be established eventually through comparison with timber in peat bogs and slow-growing trees at the timber line.

During the past five years 1933–1938, nineteen artifacts have been found and reported from muck deposits on six stream courses in the vicinity of Fairbanks. All but three were found during the last three of these years. It will be evident that the exact location of such artifacts exposed by hydraulic methods is usually uncertain, but a few have been found frozen *in situ* at great depths and in apparent association with Pleistocene fauna. Mr. Peter Maas, an employe of the Fairbanks Exploration Company, made the most remarkable discoveries of this kind at Ester Creek, where he found two flint points resembling the debated "Yuma type" frozen *in situ* at a depth of sixty feet from the original surface of the valley. One of these was described by Mr. Maas as in direct association with the maxillary bone of a young mastodon. Another "Yuma" type point was found at Goldstream, not actually *in situ* but under circumstances which convince the writer that it came

[408] Chaney, R. W. and Mason, H. L. "A Pleistocene Flora, from Fairbanks, Alaska." *American Museum Novitate* No. 887, New York, 1937.

[409] Mertie J. B., Jr. *The Yukon Tanana Region*, U.S.G.S. Bulletin No. 872, Washington, D. C. 1937.

[410] Giddings, J. L., Jr. "Buried wood from Fairbanks, Alaska," *Tree Ring Bulletin*, Vol. 4. No. 4. Tucson, Arizona, April 1938.

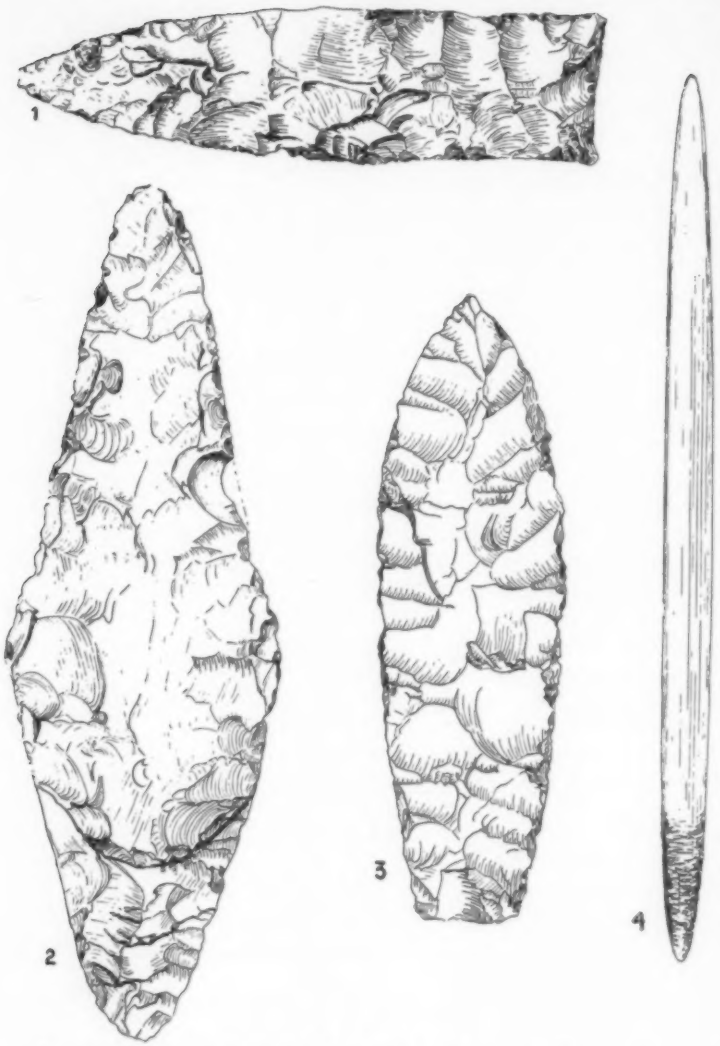

FIG. 16.—Implements found in Pleistocene "muck" deposits, Tanana Valley. 1–2. Flint blades found at Goldstream; 3. Flint blade found with mastodon skull at Ester Creek; 4. Polished bone point, Goldstream. (Natural size, except No. 4 which is ½ size.)

from the base of the muck deposit in a section containing Pleistocene mammal bones.

Other artifacts from these deposits include long, polished bone points,[411] flint blades, stemmed arrow or lance points of flint, retouched stone scrapers, and end-scrapers, a crude, bone, pick-like object, and two polished slate blades with bone and ivory handles.[412] Some of the objects may have been on or near the surface originally but others are quite certainly from the lower levels of the muck. Although burned stones and one large collection of young mammoth teeth, suggesting human habitation, have been found, no actual camp-site or habitation refuse has been located. It is obvious that the significance of these scattered discoveries will not be known until an actual refuse deposit is located, but they offer a good indication that such a deposit will be unearthed eventually for systematic excavation. Certainly, if conclusive evidence of early man in Alaska is to be found, the wholesale hydraulic excavations offer a remarkable opportunity for such a discovery.

In these investigations I have been primarily concerned with the possibilities of archaeological research in central Alaska, since before 1933 not a single productive site had been found in the entire area. In two seasons of research we have accumulated very small collections, (approximately 1000 recognizable artifacts) but we have found numerous old Athapascan sites through inquiry among the natives which will make it possible to reconstruct the aboriginal Athapascan culture of inland Alaska, and from this to determine the significance of accidentally discovered artifacts from undateable sites.

Through white settlement we have found a type of flint material, related to pre-neolithic implements in Asia, which at present, has not been specifically correlated with Athapascan culture and which may be much older. From late Pleistocene deposits, sluiced out in placer mining operations, we have obtained a number of artifacts which suggest that men were contemporary with extinct mammals in Alaska, particularly since similar artifacts have been found with the same extinct mammals in southwestern United States. The only conclusion to be drawn at present is that productive archaeological research can be carried out in this region. If we assume that inland people of Asia would follow in

[411] What appear to be the same long, polished bone points, were found by Dr. Edgar B. Howard in direct association with mammoth bones, in New Mexico. *Science News Letter*, March 20, 1937.

[412] One of these is an Eskimo "woman's knife" with a walrus ivory handle. The other resembles an Eskimo "man's knife." They are the only typical Eskimo implements found in central Alaska.

America a route of migration inland where the environment would be familiar to them, we may well expect to find evidence of late glacial or early post-glacial human migration from northeast Asia to continental America in the Yukon and Tanana Valleys which were both ice-free corridors to interior Canada in glacial times. Some evidence of such migration has been found but it is certainly not conclusive, and this summary only pretends to point out methods of approach, and a framework for future research.

ESKIMO SITES OF THE DORSET CULTURE IN NEWFOUNDLAND

W. J. WINTEMBERG

PART II[413]

Artifacts of Rough Stone

THE artifacts of rough stone consist of a crude lamp and some stone hammers, the latter unmodified by chipping or any other process.

Stone lamp. A. S. Darby found at Old Port au Choix a fragment of a lamp roughly made by hollowing out an ovoid or oblong boulder of sandstone (Plate XV, Figure 2, Number 1). The cavity is about $1\frac{1}{4}$ inches deep and is rounded from end to end and side to side. There is no wick ledge. The thickest part of the base is $1\frac{1}{8}$ inches, but the walls decrease in thickness toward the rounded edges at the top. The hollow is slightly discolored by the blubber and there is an incrustation of burnt blubber on both sides of the intact wall. There is a large natural hollow in the base.

Another crude stone lamp was found by Israel Hutchings at the Cow Head site; it consisted of a hollow stone, judging from his description. Still another specimen, from the Cow Head site, made of a material like gneiss, is oval, about 7 inches long, 4 inches wide, and 2 inches high, with the hollow about 1 inch deep.[414] One side is higher than the other.

This kind of lamp does not seem to be very common. Mathiassen briefly describes and illustrates fragments of what appear to be similar lamps from Naujan, north coast of Repulse bay, Melville peninsula.[415] One, of soapstone, possibly from an Eskimo site elsewhere in Newfoundland, is illustrated by Howley.[416] There is one of the same kind from a site on Notre Dame bay.[417]

Hammerstones. The hammers were found at only four sites visited—one at Bell Burns, one at Portland creek, another at Norris Point,[418] and thirteen at Cow Head. They consist of cylindrical, in one case almost circular, waterworn pebbles either of a dark grey rock or of a rock

[413] Part I appeared in this series Vol. V, No. 2.

[414] In Peabody Museum, Cambridge, Mass. (Cat. No. 80456).

[415] 1927, I. p. 64 and Pl. 26, figs. 1 and 2. [416] Pl. XXXII, fig. 1.

[417] In Peabody Museum, Cambridge, Mass. (Cat. No. 66424).

[418] A perforated hammer is said to have been found at the Norris Point site many years ago.

resembling granite, and measure from $2\frac{3}{4}$ to $5\frac{3}{4}$ inches in length by 1 11/16 to $2\frac{1}{2}$ inches in diameter. In cross-section they are oval, ovoid, half-round, or almost round, but most of them are oval. All but one are battered on both ends by use. The nearly round specimen, which is roughly oval in cross-section, besides being battered on opposite ends, shows abrasions on one of the narrow sides (Plate XV, Figure 2, Number 4). One (Cat. No. VIII-A-366*b*) differs from the rest in having two sloping abraded areas on the largest end. A few of those that have been used for a long time appear to be at least 1 inch shorter than they were when first brought into use. Two shallow grooves have been worn across one of the narrow sides of the specimen seen in Plate XV, Figure 2, Number 3, and it is notched on the opposite side. These notches and grooves may have been intended to hold the lashing with which the hammer was secured to a handle; however, they may also have resulted from use in smoothing sinew.

These hammers may have been used either for roughing out leaf-shaped forms like those in Plate VI, Figure 1, Number 6 and others, or to break up bones to obtain the marrow.

The writer has seen only one illustration of similar oval hammerstones from an Eskimo site.[419]

Smoothed and Polished Stone Objects

Polished stone artifacts were fewer than chipped ones. They are made of slate, nephrite, chert (most of which are only partly polished), and steatite, and consist of arrow, lance, and knife points, a chisel-like tool, adzes, scrapers, objects of unknown use, pots, and lamps.

[419] *See* Mathiassen, 1930*b*, Pl. 11, fig. 10.

PLATE XV

FIGURE 1

Soapstone cliff at Fleur de Lys, where the Eskimo carved out their pots.

FIGURE 2

Artifacts of Rough and Polished Stone
(One-fourth natural size)

1. Fragment of sandstone lamp. From Old Port au Choix. Cat. No. VIII-A-177.
2. Oval stone hammer with both ends battered. From Cow Head. Cat. No. VIII-A-366*d*.
3. Oblong stone hammer with both ends battered. From Bell Burns. Cat. No. VIII-A-263.
4. Cylindrical stone hammer. From Portland Creek. Cat. No. VIII-A-328.
5. Unfinished stone adz or scraper. From Portland Creek. Cat. No. VIII-A-327.
6. Long stone adz. From Old Port au Choix. Cat. No. VIII-A-176.

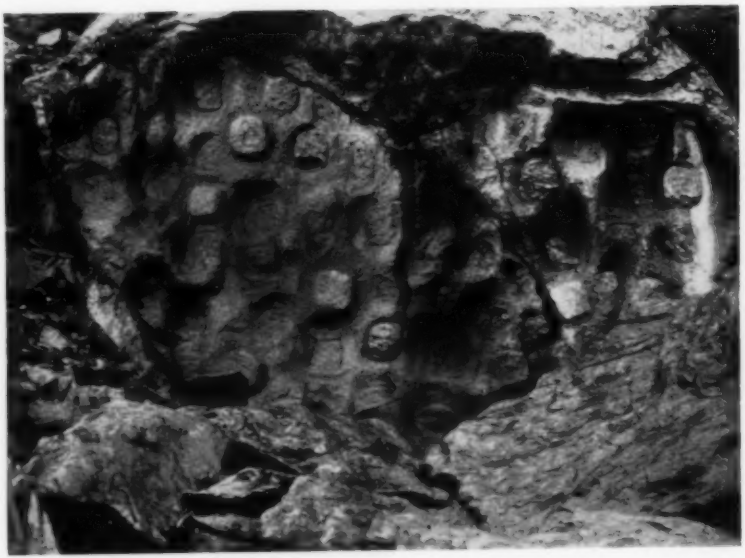

FIG. 1

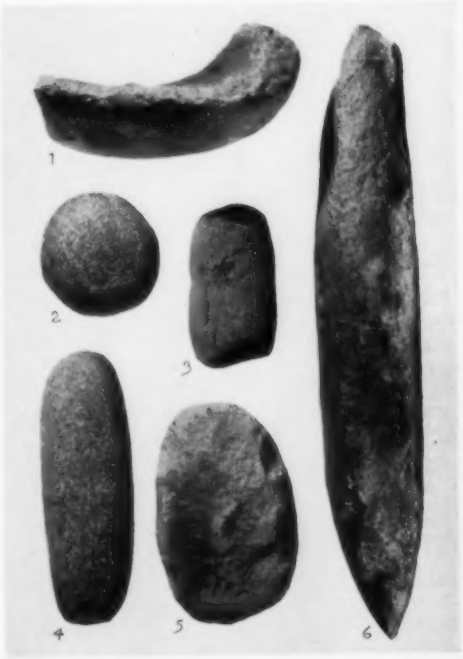

FIG. 2

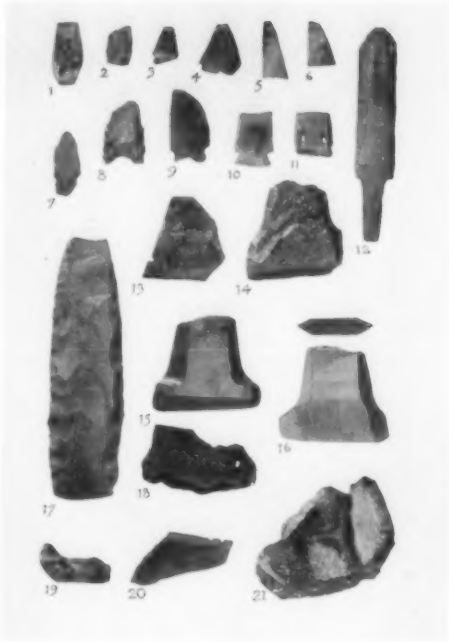

FIG. 1

FIG. 2

PLATE XVI
(All one-fourth natural size)

FIGURE 1
Polished Stone Artifacts

1, 2, 3. Slate tools. From Portland Creek. Cat. No. VIII-A-317, Cat. No. VIII-A-320, and Cat. No. VIII-A-322.
4. Stone object of unknown use. From Englee. Cat. No. VIII-A-43.
5. Fragment of slate object. From Portland Creek. Cat. No. VIII-A-318.
6. Fragment of slate object. From Port au Choix. Cat. No. VIII-A-197*b*.
7. Partly ground chipped chert point. From Daniels Harbour. Cat. No. VIII-A-272.
8. Partly ground chipped chert point. From Portland Creek. Cat. No. VIII-A-315*a*.
9, 10. Partly ground chipped chert points. From Norris Point. Cat. No. VIII-A-413 and Cat. No. VIII-A-412.
11. Fragment of ground slate point. From Portland Creek. Cat. No. VIII-A-321.
12. Broken slate lance or knife point. From Englee. Cat. No. VIII-A-77.
13. Fragment of slate knife. From Port au Choix. Cat. No. VIII-A-197*a*.
14. Scraper or adz blade of black material like chert. From Cow Head. Cat. No. VIII-A-364.
15, 16. Two sides of scraper or adz of nephrite. From Cow Head. Cat. No. VIII-A-333.
17. Partly ground chisel-like tool of chert. From Cow Head. Cat. No. VIII-A-360.
18. Fragment of lip of steatite pot. From Port au Choix. Cat. No. VIII-A-202*a*.
19. Fragment of small steatite pot. From Bell Burns. Cat. No. VIII-A-270.
20. Fragment of lip of steatite pot or lamp. From blubber-soaked deposit, Cow Head. Cat. No. VIII-A-372.
21. Fragment of large steatite pot. From Portland Creek. Cat. No. VIII-A-329*j*.

FIGURE 2
Artifacts of Bone, Antler, Teeth, and Ivory

1. Fragment, probably of harpoon point, made of bone. From Keppel Island. Cat. No. VIII-A-237*b*.
2, 3. Ivory harpoon points; one fragmentary and one complete. From Cow Head. Cat. No. VIII-A-373 and No. VIII-A-330.
4. Harpoon point of bone or antler. From Keppel Island. Cat. No. VIII-A-241*a*.
5, 6. Whale bone harpoon points. From Englee. Cat. Nos. VIII-A-21 and VIII-A-22.
7, 8, 9. Fragments of bone objects. From Keppel Island. Cat. No. VIII-A-237*a* and Cat. No. VIII-A-238 and Cat. No. VIII-A-233*a*.
10. Ivory object, possibly a chipping tool. From Keppel Island. Cat. No. VIII-A-240.
11. Split bear canine tooth. From Port au Choix. Cat. No. VIII-A-205*b*.
12, 13. Bead-like bone objects. From Cow Head. Cat. No. VIII-A-375*b* and Cat. No. VIII-A-375*a*.
14. Tubular object made from ulna of bird. From Port au Choix. Cat. No. VIII-A-208.
15, 16. Bone knife handle and drawing showing the reverse face. From Keppel Island. Cat. No. VIII-A-239.
17, 18, 19. Whale bone objects. From Port au Choix. Cat. No. VIII-A-207 and Cat. No. VIII-A-209*a* and Cat. No. VIII-A-209*b*.
20. Piece of whale bone showing cutting. From Cow Head. Cat. No. VIII-A-377.
21. Piece of antler showing cutting. From Cow Head. Cat. No. VIII-A-376.

In addition to these finished artifacts there are two worked pieces of reddish slate, another of a greenish rock resembling slate, and nine pieces of schist, two of which, from Portland Creek, may be fragments of artifacts.

Arrow, lance, and knife points. From Englee comes the broken, long-stemmed, polished slate point for a spear or knife, lenticular in cross-section and 5/16 inch thick, seen in Plate XVI, Figure 1, Number 12. In the Peabody Museum, is a nearly complete point of the same kind of material, but broader, collected by Owen Bryant in the same locality.[420]

It is uncertain if other points of this type from elsewhere in Newfoundland[421] are of Eskimo or Beothuk origin, or if they were left by an earlier people. Similar points have been found in Eskimo sites in the Arctic,[422] and in sites of uncertain culture in Ontario,[423] Maine,[424] and New York,[425] but the stems are not as long and narrow as those on points from Newfoundland, most of the blades are barbed rather than shouldered, and in some cases they are hexagonal rather than lenticular or diamond-shaped in cross-section.

Plate XVI, Figure 1, Number 13, shows a fragment of what seems to have been a long, grey slate knife blade, 3/32 inch thick, rhomboidal in cross-section and with double parallel edges, bevelled in opposite directions. What seems to be part of an oblong, gouged-out hole can be seen on one of the broken edges.

A broken point of light grey slate, $\frac{1}{8}$ inch thick, with both faces polished, and the sharp edges formed by bevelling from both faces, is seen in Plate XVI, Figure 1, Number 11. The two parallel lenticular holes were made by gouging or sawing. Besides these holes, there are lateral notches for holding the lashing with which it was secured, presumably to a harpoon head.[426]

[420] Cat. No. 66435.

[421] *See* Lloyd, 1876*b*, Pl. X, fig. 1, showing one from Twillingate Island, north coast, and Howley, Pl. XIX, figs. 1–3, 5, and Pl. XXXVIII, figs. 1, 4, 7 (the latter from the mouth of a small river that flows into St. John's Harbour; the localities of others are not given).

[422] *See* Mathiassen, 1927, I, Pl. 19, fig. *g*, showing one with a short stem from Naujan, Melville peninsula. A very fine specimen from one of the Belcher Islands, Hudson Bay, although of the same type, is small (Cat. No. 393, collection of the Dept. of the Interior, Northwest Territories Branch, collected by L. T. Burwash).

[423] *See* Wintemberg, Pl. V, figs. 3, 8.

[424] *See* Moorehead, 1922, Pls. 57, 58.

[425] *See* Parker, pt. 1, Pl. 18, fig. 2.

[426] Patterson illustrates a similar specimen in his Pl. X, fig. 1, but he does not state where it was found. Another polished slate point illustrated by him in fig. 2 of the same plate, has one of the holes above the other.

A few of the polished arrow points were chipped from chert, and in most cases have been only partly smoothed. The crudely chipped triangular point in Plate XVI, Figure 1, Number 8, has one face partly ground. Part of the sloping edge on the left side of the tip is polished and worn from use. Another point, 5/32 inch thick, chipped from light bluish-grey chert (Plate XVI, Figure 1, Number 7), has both faces and one side partly ground. An arrow or lance point of grey chert from Portland Creek, of which only the notched base was found, (Cat. No. VIII-A-315*c*), was similarly ground smooth on both faces. The large spear or knife point chipped from a dirty white chert, ½ inch thick and lenticular in cross-section (Plate VI, Figure 2, Number 43), has the edges ground smooth; and the partial smoothing also of the crests of the chipping conchoids suggests that it was the intention to polish both faces of the blade.

Ground flint or chert points have been found in other Eskimo sites, but only in the Eastern Arctic, associated with "Dorset" culture remains.[427]

Chisel-like tool. The artifact in Plate XVI, Figure 1, Number 17, is chipped from maroon chert, with the lower part of each face ground and with the edge formed by abruptly bevelling the lower end. It is roughly lenticular in cross-section and 7/16 inch thick. Only a few similar specimens have been found in Eskimo sites.[428]

Adzes. The stone adzes found in these sites are more like those from Woodland or Algonkian than from Eskimo sites.

What is probably an unfinished adz (Plate VI, Figure 1, Number 8) consists of a roughly chipped and partly polished piece of rock, ½ inch thick at the upper end and 1 3/16 at the other.

The crude adz-like object in Plate XV, Figure 2, Number 5, is derived from a spall broken from a boulder of hard, light grey rock, 1 3/16 inches thick. Only the waterworn surface shows marks of chipping, but the broken face of the spall has been dressed into shape and partly smoothed. The cutting edge is fairly sharp. A spall from a boulder of dark grey rock from the Cow Head site (Cat. No. VIII-A-365), 5 inches long, 3 3/16 wide and about 1½ inches thick at the upper end, thins down to an almost sharp edge at the lower end, and may have been intended for a similar blade. It retains the waterworn surface of the rock

[427] *See* Mathiassen, 1927, I, Pl. 61, fig. 13, from Button point, Bylot Island, Baffin Land.

[428] Cf. Mathiassen, 1930*b*, fig. 29, *1* (after Thomsen) showing a similar chisel-like implement from west Greenland.

on one face and has been trimmed into shape on the upper end of the broken face. The thin edge looks as if it had been worn by use, but this may be due to sand erosion.

The writer does not know of any similar massive adzes from Eskimo sites; even other large adz-like forms are scarce at other sites in the Arctic. Boas considers a specimen $5\frac{7}{8}$ inches long and about 2 inches wide, from Cumberland Sound, as a skin scraper,[429] and it is possible that the specimen in Plate XV, Figure 2, Number 5 was used for the same purpose.

The slender, flat-backed, parallel-sided adz, 2 inches thick, made of a soft grey rock like limestone (Plate XV, Figure 2, Number 6), although much larger, is of the same type as some adzes from presumed Beothuk sites,[430] and from Woodland sites in Quebec, and the New England states.[431] It may therefore be of non-Eskimo origin.

Scrapers. The scraper blade in Plate XVI, Figure 1, Number 14, 5/16 inch thick, is made of a hard, black chert-like material. Parts of the shank, which is somewhat hexagonal in cross-section, are left in a rough, chipped condition, and the upper reverse face is ground down at a slant like the specimen in Number 16. The dull edge is abruptly bevelled. A similar blade, except that it is more highly finished, and made of dark green or almost black nephrite, is seen in Plate XVI, Figure 2, Numbers 15 and 16. It is one of four objects of this material known from Newfoundland.[432]

These blades were probably used as skin scrapers, inserted in sockets of antler or bone handles, like those of the Kinipetu of the west coast of Hudson bay,[433]

Similar blades are known from Eskimo sites elsewhere in the Arctic,[434] but only one that the writer has seen has a shank that is hexagonal in cross-section.[435]

Objects of unknown use. Several of the polished stone artifacts are of unknown use.

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[429] *See* Boas, 1907, fig. 41*a*.

[430] From the bay of Exploits (Cat. No. VIII-A-168, Nat. Mus. Can.).

[431] *See* Moorehead, 1922, fig. 51, third specimen from top.

[432] Nephrite objects have been reported from farther south, in New Brunswick (Bailey, p. 12), Connecticut (Norris L. Bull, letter of Oct. 3, 1932), and even as far in the interior as Ohio (Mills, 1922, fig. 92 (centre) and p. 400).

[433] *See* Boas, 1907, p. 92 and fig. 134 *c* and *d*.

[434] See Emmons, Pl. XIII, fig. *c*. Four specimens in the National Museum of Canada, are of the same shape, although some are much longer. (Cat. Nos. IX-F-2455 and IX-F-2782 *a* and *c*).

[435] From Alaska (Cat. No. IX-F-2452, Nat. Mus. Can.).

A small fragment of a polished slate artifact, 9/16 inch wide and $\frac{1}{8}$ inch thick, from Keppel Island (Cat. No. VIII-A-229), has blunt-edged, parallel sides formed by sharp bevelling from both faces. These edges are too blunt to have been used for cutting, so the fragment may be part of an arrow point. At Port au Choix was found a small basal fragment, $\frac{5}{8}$ inch wide and $\frac{1}{8}$ inch thick (Cat. No. VIII-A-197*c*) with similarly produced edges, that may have been an artifact of the same kind; the basal edge is sharp and slightly oblique. A triangular fragment of a slate artifact, from Portland Creek (Cat. No. VIII-A-319), with one edge formed by bevelling from both faces, may be part of a semilunar knife.

A complete slate object (Plate XVI, Figure 1, Number 1), 3/16 inch thick, has one end bevelled to form a dull chisel-like edge. Both faces and sides are flattened and polished and the long edges on the face illustrated are chamfered. Part of the lower end of one face is left in the rough.

The small artifact of grey slate, 3/32 inch thick, seen in Plate XVI, Figure 1, Number 3, is one of four unique specimens from Newfoundland. Both faces are flattened and polished; and the base and the edge of the notched side are squared off, whereas the small end and the long edge are sharpened by abruptly bevelling from both faces.[436] The other specimen (Plate XVI, Figure 1, Number 4), $\frac{1}{8}$ inch thick, and made of a hard, dark, bluish-grey, fine-grained rock resembling slate, was found by Jenness at Englee. The edge of the notched side is slightly oblique, the small end is sharper than on the smaller specimen, but the other long edge was formed in the same way. Two broken specimens of nephrite, from Port au Choix, one of them with two notches on one edge are in the Peabody Museum, Cambridge, Mass.[437] A specimen apparently of the same type is illustrated by Howley,[438] but it is longer, and the squared tip does not seem to be quite as broad as in those just described. Two fragments of polished slate objects (Plate XVI, Figure 1, Numbers 5 and 6), each 3/32 inch thick, seem to be parts of artifacts of the same type as those in Numbers 3 and 4 of the same figure, although they must have been longer; they differ, however, in having the

[436] Mathiassen, 1927, I, Pl. 44, fig. 22, illustrates a similarly shaped object, chipped from chert, from an Eskimo site, Ponds Inlet, which he calls "a crooked knife blade."

[437] Cat. No. 80464, *b*, *c*.

[438] Pl. XXII, fig. 22. Howley does not give the material or the locality where it was found. In the Peabody Museum (Cat. No. 80464*a*) there is a specimen made of nephrite, from Port au Choix, which is identical in shape and probably the same specimen.

edge of the tip squared. The long, straight side is squared off as in the complete specimens, whereas the curved side is bevelled from both faces. The fragment in Plate XVI, Figure 1, Number 2, $\frac{1}{8}$ inch thick, with a V-shaped notch on one edge, may also fall into the same category. Both faces are smoothed and polished and the edge of the notched side is squared off. The tip and part of one side are missing.

The specimen in Plate XVI, Figure 1, Number 9, 5/32 inch thick, with both faces and the straight edge ground smooth, may be in process of transformation into either a knife blade or one of the objects seen in Numbers 3 and 4 of the same plate; the tip at least is shaped like that on those blades. The tip of a similarly partly ground chert specimen from Notre Dame Bay is squared.[439]

The notch on one edge of each complete specimen suggests that it was lashed to some sort of handle.

The writer has seen only one other similar object from an Eskimo site in the east,[440] but what appear to be objects of the same class were found in a site of the Old Bering Sea culture on St. Lawrence Island, Alaska.[441] What may have been an implement of the same type, from Admiralty Inlet, is illustrated by Mathiassen,[442] but it is longer than the two complete specimens in Numbers 3 and 4 and is not notched; the tip is cut off obliquely.

It is possible that these objects were used as boot creasers.

The point with the tip missing, seen in Plate XVI, Figure 1, Number 10, is chipped from grey chert and has both faces and sides ground smooth, making it rectangular in cross-section. The only part that retains the chipping conchoids is the base and the notches. It is 3/32 inch thick.

One of the simplest of these chipped and polished chert objects is a chip of grey chert found at Portland Creek (Cat. No. VIII-A-315*b*), triangular in cross-section, quite sharp on one edge, and with one end and one edge ground smooth. It may have been set in a handle and used for a knife.

It is not certain what was used to grind these chert specimens into shape; nothing that could have been used for the purpose was found by the writer, or at least nothing of an abrasive character that was sufficiently hard. Jenness, however, illustrates and describes a quartz rub-

[439] Cat. No. 66409, *d*, Peabody Museum.

[440] Found by the writer on the surface of a site at Point de la Chasse, Saguenay Co., Que., on north shore of Strait of Belle Isle (Cat. No. VIII-E-379, Nat. Mus. Can.).

[441] *See* Collins, Pl. 39, figs. 19 to 22. [442] 1927, I, fig. 64.

bing stone from Cape Dorset which he thinks might have been used to polish stone objects.[443] Perhaps they were rubbed on flat sandstone rocks or on hard rocks covered with sand.

It is to be noted that all the ground chert points, with two exceptions, are of a mottled greenish-grey color, and it is possible that this material was more easily ground than chert of other colors.

Objects chipped from chert and other siliceous materials from eastern Canada and United States are very rarely ground or polished, and then only to produce an edge.[444]

Steatite pots. The writer found fragments of steatite pots on the sites at Port au Choix, Keppel Island, Bell Burns, Portland Creek, and Cow Head; local residents also found fragments at the latter site. Most of the pieces come from Keppel Island. Mr. James L. Humber told the writer that he found the half of an oval vessel of steatite in a field north of the site at Norris Point. What may have been the other half of the same vessel was found about 1904 by Mr. John W. Roberts' grandfather, near Lighthouse Point, at the north end of the village of Bonne Bay. It was bowl-shaped,[445] about 6 inches long, and 4 inches deep. Jenness did not find any fragments of pots at Englee, on the northeast coast, but Lloyd discovered some at a site on Sop Island, at the head of White Bay, and at Conche Harbour[446] (now Conche), north of Englee. These were mostly quadrangular; only one fragment seemed to be part of an oval pot. A pot is also reported from a site on Long Island, Placentia Bay, on the south coast, but the presence of stone gouges would seem to indicate that it is probably not of Eskimo origin;[447] at least we have yet to find a stone gouge in an undoubted Eskimo site.

The fragments secured by the writer appear to be parts of rectangular pots, with the long sides more or less vertical and the narrow ends sloping outward from the base. The end wall of a small specimen, of which a fragment was found at Bell Burns, and also the end wall of a larger pot from the Portland Creek site, slant at an angle of about 60°. The walls seem to have been of uniform thickness, but they were not as thick at the base. The thickest piece of what seems to have been a bot-

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[443] 1925, p. 432 and fig. 4, *o*.

[444] *See* Thruston, figs, 130 to 133, showing flint chisels and knives from Tennessee; Mills, 1922, fig. 91, showing flint celts found with intrusive burials in mounds in Ohio; and Funkhouser and Webb, fig. 30, upper left, showing a celt from Kentucky.

[445] Pots oval in outline at the top have been found in Eskimo sites (*see* Mathiassen, 1927, I, fig. 62, showing one from Bylot Island, Baffin Land, and Pl. 27, at top).

[446] Lloyd, 1876,*b*, pp. 234, 235. [447] *See* Howley, p. 327.

tom measures $\frac{5}{8}$ inch. What appears to be part of the long wall of the piece from Bell Burns is 5/32 inch thick, the sloping wall 3/16 inch, and the base $\frac{1}{4}$ inch. Some of the walls diminish in thickness toward the top.

None of the larger pieces are sufficiently complete to give an idea of the size. The walls of the one from the Bell Burns site were $\frac{3}{4}$ inch high. The more complete ones secured by Lloyd were from pots from "8 to 9 inches in length and breadth, about 4 or 5 inches in height, with a depth inside of some 3 inches or thereabouts."[448]

A fragment of what appears to have been a rectangular pot, from the site at Port au Choix (Plate XVI, Figure 1, Number 18), has in its side, about $\frac{1}{2}$ inch below the edge, a gouged-out, oblong hole, about $\frac{1}{8}$ inch by 3/16 inch in diameter. A fragment from the Portland Creek site is similarly perforated. Lloyd also mentions perforated fragments from Conche Harbour. The holes may have been intended for suspending the pots, but they are in a different position from those in other rectangular pots, in which they are bored diagonally through the top of each corner.[449] They may also have been for repairing the pots when they became broken.

A fragment 7/32 inch thick, from the Cow Head site, also probably part of the top of a pot, has two deep V-shaped notches, about 5/16 inch apart, in the sharply bevelled edge (Plate XVI, Figure 1, Number 20).

Most of the fragments have smooth surfaces, and those from the bottoms have both sides parallel. One fragment from Keppel Island, however, is very uneven along the inside of the bottom, although it seems to have been even outside; one part, near the base of the wall, is only about 3/16 inch thick, whereas another part, less than an inch away, has a thickness of 9/16 inch. The marks of the tool used to excavate the hollow in this pot are still visible.

The base angles of some of the pots are not squared, but are rounded or chamfered.

Most of the fragments are incrusted with a black substance, evidently the carbonized remains of food or oil cooked in them.

The writer does not believe that any of the pots here described are

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[448] Lloyd, 1876*b*, pp. 236–237. Two steatite pots, one of which is rectangular and the other roughly square, from what may be Eskimo sites, Notre Dame Bay, in the Peabody Museum (Cat. Nos. 66422 and 66423), have the four sides sloping outward from the base.

[449] In some cases the suspension holes are bored through lugs on the inside of the corners (*see* Larsen, Pl. 6, fig. 14, and Pl. 13, fig. 13).

of Beothuk origin, although the Beothuk are said to have manufactured and used similar vessels.[450] Only one is known to have been found in a Beothuk grave,[451] but a statement of Howley's would seem to imply that they were common in burial places.[452] In his Plate XXXII he illustrates four specimens, two roughly square, one rectangular, and one oval, alongside a photograph of a steatite cliff near Fleur de Lys, on the north coast, east of White Bay, where the material for such pots was quarried. A clearer photograph, taken by Jenness, is reproduced in our Plate XV, Figure 1. The scars indicate that the pots were partly shaped before they were detached from the face of the cliff; but there are no signs of undercutting to facilitate breaking. Most of the scars are square; others are round or oval.

Thin plates. A quadrangular plate of steatite, about 8 by 10 inches in diameter and about $\frac{1}{8}$ inch thick, with all the edges bevelled, was found by Charles Payne in the Cow Head site. Probably the thin fragment seen in Plate XVI, Figure 1, Number 20, from the same site, is part of another plate. They may have been bottom plates of compound pots, with the edges of the separate sides bevelled so as to fit the correspondingly bevelled edges of the bottom plates. The writer has not heard of similar plates from other Eskimo sites.

Lamps. A few fragments of what seem to have been steatite lamps were found in the sites at Port au Choix and Keppel Island; others, from Portland Creek, may also be parts of lamps. The largest fragment, from Port au Choix, $4\frac{3}{4}$ by $3\frac{1}{2}$ inches in diameter, is the only one sufficiently complete to give some idea of its shape. The front edge of this specimen was somewhat straight, whereas the sides and back were turned up, and about $\frac{3}{4}$ inch high. There is no wick ledge as in most Eskimo lamps. The bottom of the inside and the basal surface are both perfectly flat. It is of a uniform thickness of $\frac{1}{2}$ inch, except the front, where it is bevelled from below and the edge is rounded off. Both inside and outside surfaces are covered with a thick crust of carbonized oil.

This lamp was probably semicircular and shaped like certain lamps from the west and east coasts of Hudson Bay and Smith Sound, illustrated by Boas,[453] but it was much smaller, probably only from about 6 to 8 inches wide across the front.[454]

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[450] Lloyd, 1876*b*, p. 229, on the authority of John Peyton.

[451] *See* Howley, p. 332, found with human remains on a small island in Pilley's Tickle, Notre Dame Bay.

[452] *Ibid.*, p. 336.

[453] *See* Boas, 1907, figs. 236 *a–d*, 237, 238, and 239 *a*, *b*. *See* also, Hough, Pl. 24, figs. 3, 4.

[454] One figured by Boas is 90 cm. or about $35\frac{1}{2}$ inches long.

Artifacts of Bone, Antler, and Ivory

As stated earlier, artifacts of bone, antler, and ivory are much less numerous than those of stone. They comprise harpoon points, a possible arrow point, part of what seems to have been a compound knife handle, an awl, needles, needle cases, some objects of unknown use, and several pieces that show methods of working. They were found in most of the larger sites (Cow Head, Bell Burns, Keppel Island, and Port au Choix), but all bone material had disappeared from the site at Portland Creek. No artifacts of baleen[455] were found, although bones of the whale were present at two sites.

The bone and ivory artifacts are limited in variety as compared with those from Eskimo sites in the Arctic. To mention only the more important, the following artifacts were absent from Newfoundland sites; long solid points for deer arrows, blunt heads for bird arrows, twisters for bow sinew lashing, arrowshaft straighteners, bola balls, outer and inner prongs for bird darts, side prongs for salmon spears, harpoon accessories such as foreshafts, socket pieces for shafts, finger rests, sealpoke inflators and stoppers, wound plugs, handles for semilunar knives, handles for men's knives, mattocks, snow knives (which are probably lacking because the people did not build snow houses), snow prods, ice picks, adz heads, adz handles, mouth-pieces for bow drills, snow goggles, dog[456] traction accessories, such as harness toggles, trace buckles and sled shoes, handles for scrapers, scrapers of caribou scapulae, thimble holders, combs,[457] and pendant ornaments.

Harpoon Heads

Two heads were found by Jenness on the northeast coast and five others, mostly fragmentary, were secured by the writer from sites on the northwest coast.

Four different types of harpoon heads found in "Dorset" culture sites and others characteristic of the Thule culture of the eastern Arctic[458]

[455] To avoid confusion, the material popularly called whalebone is here referred to as baleen, whereas whale bone refers to the bone of the whale.

[456] No dog bones were found by the writer in any of the Newfoundland sites.

[457] Although not found in any of the Newfoundland Eskimo sites, combs with from ten to twenty-two teeth have been found in Beothuk graves (Howley, p. 290). Some of them resemble those from Thule sites in having the sides of the top or grip incurved. (Compare, for example, Howley, Pl. XXVII, figs. 35–38, with Mathiassen, 1927, I, Pl. 52, fig. 3, and Pl. 63, fig. 4).

[458] *See* Mathiassen, 1927, I, Pl. 1, figs, 1–12, Pl. 2, figs. 1, 2, 4, 6, 7, Pl. 4, fig. 8, and Pl. 37, figs. 2–4, 9.

are absent from the Newfoundland sites. Some of the "Dorset" heads have an open socket,[459] a line hole through the middle or rear half, and a sunken bed for the lashing that held it in place.[460] Another kind, with blade slits and two spurs, has the line hole running from side to side.[461] A third type is provided with blade slits, two spurs, and two parallel oblong line holes, from which, on one face, grooves extend to the rear.[462] Two other kinds are most nearly like those secured by the writer.[463]

The fragment of a bone object, 3/16 inch thick, concavo-convex in cross-section, and with both edges and faces smoothly finished (Plate XVI, Figure 2, Number 1), may be part of the barbed edge or the basal portion of a harpoon head, the broken hole being either the axil of a barb or part of the line hole.

The fragment of a bone or ivory object in Plate XVI, Figure 2, Number 2, may be part of a harpoon head with the line hole passing directly through from side to side.[464] The lower end is wedge-shaped; part of the side shown is split off and part of the lower face is also split off. The edges of three sides of the raised portion are bevelled, and the notches on the sides were formed by gouged-out, irregularly-shaped lateral holes. The raised part of the object is decorated with three longitudinal engraved lines, the one in the middle being about three times as long as the others.[465]

Two harpoon heads, one apparently of antler and the other of whale bone, found by Jenness at Englee, are seen in Plate XVI, Figure 2, Numbers 5 and 6. Both have solid, pointed tips, lenticular in cross-section, whereas the lower part of the head is oblong in cross-section. The one in Number 5 is 5/16 inch thick, the other 7/16. Each has two line-holes, one above the other, both of which seem to have been gouged

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[459] *See* Jenness, 1925, fig. 8, *a–c*.

[460] One open-socketed specimen has been found in Newfoundland, which may be from an Eskimo site (*see* Howley, Pl. XXV, fig. 8).

[461] *See* Jenness, 1925, fig. 8, *h*, *j*. An ivory miniature of this type of harpoon head carved to represent the inserted blade, but with the line hole and socket merely indicated, was found at Port au Choix (probably in the grave); it is in the Peabody Museum (Cat. No. 80483*d*).

[462] *Ibid.*, fig. 8, *n*, *o*.

[463] *Ibid.*, fig. 8, *d–g* and *k–m*.

[464] *Ibid.*, fig. 5, *i–k*, and fig. 8, *h–j*.

[465] Dr. de Laguna suggests that it is a fragment of an ornament similar to one from the grave near Old Port au Choix, in the Peabody Museum (Cat. No. 80478*a*), illustrated by Howley in his Pl. XXIV, fig. 19; the details are not brought out clearly in the illustration, and the rectangular holes that run diagonally through each edge can not be seen. The notches on the sides of our specimen are probably parts of similar diagonal holes.

out.[466] In one head (Number 5) the upper hole is round and the lower one oval; in the other head, both are rectangular. On one face in each specimen, the holes are connected by a shallow groove to hold the line or lashing. The socket holes are rectangular; in the former specimen 7/16 inch by 3/32 inch in diameter and about ¼ inch deep, in the latter, where the hole seems to be rounded at the bottom, 9/16 by ⅛ inch in diameter and about ¼ inch deep.

The basal end of a harpoon head of what seems to be antler, from Keppel Island (Cat. No. VIII-A-241*b*), may have been of the same type as Numbers 5 and 6 of the aforementioned figure. It is oblong in cross-section, with both narrow sides rounded and both faces flattened. The remaining line hole is roughly oval and seems to have been made by gouging from both faces; it is 7/32 inch long and 3/16 inch wide. The socket hole is double concave, 9/16 by ⅛ inch in diameter and about 3/16 inch deep; the bottom is rounded.

Two other specimens, one of ivory and the other possibly of the same material, although so badly decayed that it is difficult to determine, are less than one-half the size of the specimens in Numbers 5 and 6. The best preserved specimen (Plate XVI, Figure 2, Number 3) was found at the Cow Head site by Stephen Taylor and presented to the writer by his son, Bertram Taylor; it is 5/16 inch thick and polished on all sides. The front end is oval in cross-section and the rear, half-round. The line holes, which seem to have been gouged out, are somewhat rectangular, the smaller one 5/32 inch by ⅛ inch in diameter and the larger 3/16 by 5/32 inch. The lateral spurs are moderately sharp. The rectangular socket hole is more carefully made than the line holes, all the angles being squared but the bottom is rounded; it is 9/32 by 3/32 inch in diameter and about 5/32 inch deep. The blade slit in the tip is V-shaped, 11/16 inch deep, and at right angles to the line holes. Both faces are ornamented with graved lines from end to end, one on each side of the line holes, and another, but shorter, extending from the lower edge of the bottom hole to the base.[467] The other specimen (Plate XVI, Figure 2, Number 4), of nearly the same shape as Number 3, is 5/16 inch thick and oblong in cross-section, and has only one line hole,

[466] Jenness (1933, 391) has called attention to the fact that holes made with the bow drill were conspicuously absent from artifacts of the "Dorset" culture; and they are also absent from all the bone artifacts from Eskimo sites in Newfoundland.

[467] A harpoon head from the Naujan site, Melville peninsula, has somewhat similar lines below the line hole, which Mathiassen considers ornamental (*see* his 1927, I, p. 26, and Pl. 4, fig. 8).

which is rectangular, 5/32 by 3/32 inch in diameter, and apparently gouged out. The base is indented and one of the spurs is missing. The rectangular socket hole is about 1/16 inch wide and $\frac{1}{8}$ inch deep; the bottom seems to have been rounded. The blade slit is V-shaped, $\frac{1}{4}$ inch deep, and at right angles to the line hole. An incised narrow groove extends from near the tip to the upper edge of the line hole and again for about 3/16 inch below the hole on one face; it may have been intended for ornament, as also, probably, were the short grooves on the opposite face, extending diagonally from each corner of the hole, unless they were intended as property marks.

Howley illustrates four bone or ivory harpoon heads from the grave near Old Port au Choix of the same type as some of those described above;[468] and in his text he refers to these specimens, as probably "spear sockets." All of them appear to have had oblong or rectangular socket holes. Two have a single line hole each;[469] another has two holes, one above the other;[470] and the fourth, two holes side by side.[471] Two other heads from the same Old Port au Choix grave, collected by Mr. Billard and purchased from him by Dr. A. V. Kidder, are now in the Peabody Museum; both have rectangular sockets.[472]

The points with one line hole above the other are unlike the two-holed ones from "Dorset" culture sites in that most of the latter have the holes placed side by side, either in the middle or near the rear of the head.[473] Very few Eskimo harpoon heads[474] of other types have the line holes in the same position as those in Plate XVI, Figure 2, Numbers 3, 5, and 6. The harpoon points from Cape Dorset and its vicinity that most closely resemble our specimens are illustrated by Jenness;[475] and one from Hall Land, northern Greenland, is illustrated by Mathiassen.[476] Heads of another type, without a blade slit, expanded at the middle, carinated or faceted on both faces, and with a single line hole or with two holes placed side by side, come from Coats Island,[477] But-

[468] *See* pp. 328 and 329. [469] Pl. XXIV, figs. 29*a* and 31.

[470] Pl. XXIV, fig. 30. [471] Pl. XXIV, fig. 32.

[472] Cat. No. 80466, *a*, *b*. One (*a*) seems to be the one illustrated by Howley in his Pl. XXIV, fig. 29*a*.

[473] *See* Jenness, 1925, fig. 5 *g* and fig. 8 *f*, *g*, *n*, *o*; and Mathiassen, 1927, I, Pl. 61, fig. 20.

[474] *See* Mathiassen, 1931–32, Pl. 2, fig. 3; and 1933, Pl. 6, figs. 10, 20, and Pl. 10, fig. 43. [475] *See* 1925, fig. 5*f*, *g*, *h*, and fig. 8*k*–*m*.

[476] *See* 1929, fig. 10*l*. It is only 2.5 cm. long and Mathiassen considers it a toy.

[477] *See* Jenness, 1925, fig. 8 *d*, *e*, *f*, *g*, most of which are grooved from the line hole to the base to form seats for the lines.

ton Point in northern Baffin Island,[478] Kuk on Southampton Island,[479] and Grinnel Land,[480] all of them alike, however, in having rectangular socket holes.[481]

As no polished slate blades were found suitable for insertion in the slits of the heads in Plate XVI, Figure 2, Numbers 3 and 4, it is probable that some of the chipped triangular points, some of which fit the slits, were used for these harpoon-heads rather than for arrowheads.

The smaller harpoon points were certainly too small to have been used for killing whale or walrus. Probably they were employed only in securing fish and perhaps the smaller species of seal.

If foreshafts were used in connection with the harpoon heads, they must have been provided with a flattened end, rounded from side to side in some cases, to fit the rectangular socket holes. No bone or antler objects that could have been used for the purpose were found by the writer. Howley, however, describes two bone objects with "blunt chisel edges at one end," which "taper away to points at the other," from the Old Port au Choix grave,[482] which may have been used as foreshafts. Jenness illustrates specimens of the same kind, except that they have line holes through one side.[483] Mathiassen[484] illustrates an ivory specimen from Hall Land, which was probably used as a foreshaft.

Bilaterally Barbed Bone and Ivory Points

The tip of a small, delicate dart-point of bone, alternately barbed on both edges, and 3/32 inch thick at the break, was found in the Cow Head site (Cat. No. VIII-A-374). The barbs are sharp but the tips do not seem to have projected beyond the sides; the axils of the barbs are acute. When complete, this specimen may have been of the same kind as some of those from "Dorset" sites elsewhere.[485] Howley illustrates two somewhat similar specimens from the grave near Old Port au Choix; one with a lenticular line hole through the pointed base[486] and the other with an oval hole near the middle, a blade slit parallel with the hole, and a bifurcate base in which is a rectangular socket.[487] Another

[478] *See* Mathiassen, 1927, I, Pl. 61, figs. 20, 21.

[479] *Ibid.*, Pl. 72, fig. 2, and Pl. 73, fig. 1. [480] *See* Greeley, Pl. III, fig. 6.

[481] *See* Mathiassen, 1929, pp. 214–215, for distribution of "Dorset" points of the types under discussion; also, 1927, II, pp. 28–30.

[482] These are probably the artifacts illustrated in his Pl. XXIV, figs. 38 and 41, now in Peabody Museum (Cat. No. 80467, *a*, *b*).

[483] *See* Jenness, 1925, fig. 6*m*, *n*, *p*. [484] *See* Mathiassen, 1929, fig. 10, 2.

[485] *See* Jenness, 1925, fig. 6*b*, *d*, *f*, *h*, and fig. 9*g*.

[486] Howley, Pl. XXIV, fig. 27, now in Peabody Museum (Cat. No. 80483*c*).

[487] Howley, Pl. XXIV, fig. 26, now in Peabody Museum (Cat. No. 80383*b*).

point, with a single barb on each side, is similarly provided with an oval line hole and a bifurcate base with rectangular socket.[488]

Miscellaneous Bone, Antler, or Ivory Objects

Shark tooth arrowpoint or knife blade. A shark's tooth[489] with the beginning of a perforation through the root, found at the Cow Head site by a Mr. Payne, may have been intended either for an arrow-point or an ornament; or it may have been set in a handle with other teeth and used as a knife. Knives of this kind are known to have been used by Greenland Eskimo.[490]

Knife handles. The specimen, perhaps one of a pair, seen in Plate XVI, Figure 2, Numbers 15 and 16, is probably part of a unique type of compound knife handle.[491] The scarfed end may have been lashed to a wooden handle, and the deep V-shaped diagonal and horizontal grooves on the opposite face (Number 16), served as beds for the lashing, with which it was secured to the wooden part of the handle. The base of the knife was evidently inserted in the conical open socket and held in place by the lashing around the sunken bed prepared for it at the larger end. The holes were gouged out. It is 9/32 inch thick.

Two other kinds of knife handles, that were found in the grave near Old Port au Choix, and now in the Peabody Museum, may be mentioned here. Two small specimens, one of antler and the other of ivory, with one edge more curved than the other, have a narrow lateral blade socket at the larger end. There is a V-shaped notch opposite the blade socket on each specimen, which was probably intended to hold the lashing that held a perforated blade in place in the socket.[492] Similar handles have been found in "Dorset" sites elsewhere.[493] Another specimen, of antler, with the top at one end carved to represent the head of an animal, was probably an ulu handle; a shallow blade socket extends almost from end to end; and a small rectangular hole running from top to bottom near the other end looks as if it had been intended to hold a tang-like projection on the blade.[494]

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[488] Howley, Pl. XXIV, fig. 25, now in Peabody Museum (Cat. No. 80483*a*).

[489] Compare with Smith, Pl. V, fig. 22.

[490] *See* Thalbitzer, p. 477 and fig. 187.

[491] Compare with Porsild, fig. 41*C*, showing a specimen which is scarfed at one end to facilitate attachment to a wooden handle.

[492] Cat. No. 80484*b* and *c*; *c* is evidently the one illustrated by Howley in his Pl. XXIV, fig. 21.

[493] Compare with Jenness, 1925, fig. 7*b*, *c*.

[494] Cat. No. 80479, Peabody Museum. Howley's Pl. XXIV, fig. 34, may be this specimen.

Chipping tool. The broken ivory object, with all but one side smoothed, seen in Plate XVI, Figure 2, Number 10, is scarred on the rounded end and may have been used as a chipping tool. It is ½ inch thick.

Awl. A fragment of an awl-like tool derived from a splinter of a hollow bird bone, with the long edges slightly smoothed, is seen in Plate XVI, Figure 2, Number 9.

Needles. Several small bone needles with an eye through the larger end were found at the Cow Head site; one, found by Stephen Taylor of Bonne Bay, was in a bone case. A specimen 9 inches long, from the grave near Old Port au Choix, is "very slightly curved, one end pointed, the other a little flattened with an oblong eye hole drilled through it. The inner and outer sides of this needle are bevelled away to fairly sharp edges. A slight groove extends along either side on the central or higher part, reaching from the eye to the point."[495] What appears to have been a similar needle, but not so long, was found in a site south of Lighthouse Point, Bonne Bay.

Needle cases. A plain tubular needle case containing a bone needle was found by Stephen Taylor at Cow Head. A section of an ulna, probably of the Canada goose, 3 13/16 inches long, with the proximal end roughly broken and the other end evenly broken off (Plate XVI, Figure 2, Number 14) may be in process of manufacture into a needle case. A fragment of another specimen, from Keppel island (Cat. No. VIII-A-234), has one end neatly broken off, but there are no marks of scoring visible. Similar needle cases were found at Kuk, on Southampton Island, Hudson Bay;[496] and a few other tubes that probably served the same purpose occurred at sites in King William Land.[497] There are several specimens in our archaeological collections from Alaska,[498] and many others in our ethnographical collections from Coronation Gulf, where, down to recent times, Eskimo hunters carried them in their quivers.

Beads. Two tubular objects made from sections of bird ulnæ, apparently of the Canada goose, may have been beads. The one in Plate XVI, Figure 2, Number 13, was made by severing the proximal joint and the major portion of the other end of the shaft by scoring and break-

[495] Howley, p. 329. *See* his Pl. XXIV, fig. 1, which shows a specimen now in the Peabody Museum (Cat. No. 80481). Mathiassen, 1927, I, illustrates a large bone needle with a similar terminal eye (Pl. 12, fig. 6), which he calls a "trout needle" (p. 42). Attached to a thong it was used to string salmon trout.

[496] *See* Mathiassen, 1927, I, Pl. 69, fig. 16. [497] *Ibid.*, pp. 309–318.

[498] Cat. Nos. IX-F-282 *l*, IX-F-2526*k*, and IX-F-4292*a*, Nat. Mus. Can.

ing, but the cuts were not smoothed. A small specimen, 11/16 inch long, has both ends neatly smoothed (Plate XVI, Figure 2, Number 12).[499] The specimen in Number 13 may also have been part of a snare, through which the noose was passed to allow it to run freely.[500]

Ornaments. The writer found no thin antler and ivory ornaments like those from the grave near Old Port au Choix, illustrated by Howley,[501] but it is probable that some will be found when some of the sites in and near that place are excavated.

Objects of unknown use. Several objects, mostly fragmentary, are of unknown use.

The broken object in Plate XVI, Figure 2, Number 8, has a gouged-out lenticular hole near the unbroken end.

A fragment of an object made of a concavo-convex piece of bone, about 1 11/16 inches long, 9/16 inch wide, and $\frac{1}{8}$ inch thick, with one edge smoothed, was found in one of the ruins at the Keppel Island site (Cat. No. VIII-A-236). One of the ends seems to have been rounded.

Another fragmentary bone object, also from Keppel Island, is seen in Plate XVI, Figure 2, Number 7. One face is ridged from end to end and it is hollowed on the other. It is $\frac{3}{4}$ inch wide and 3/16 inch thick. The incised parallel longitudinal lines on the ridged face were probably ornamental.

An object of whale bone, perhaps part of a knife handle, severed by cutting and breaking, is seen in Plate XVI, Figure 2, Number 17. It is $\frac{1}{2}$ inch thick. The hole is lenticular and was made by gouging from both faces, leaving an opening 11/32 by 3/32 inch in diameter. On the side illustrated there is a deep, V-shaped groove, which extends from the hole to the severed end.

Specimens showing methods of working. Besides the completed artifacts there are a few worked pieces of bone, antler, and teeth.

One is a piece of whale bone (probably part of a rib), $\frac{1}{2}$ inch thick, showing two long parallel cuts, about $\frac{1}{4}$ inch apart, extending from end to end on the outer surface of the bone (Plate XVI, Figure 2, Number 18). Another large fragment of whale bone (Number 19 of the same figure), 1 inch thick, shows the method of severing bone by hacking

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[499] Short beads, similarly derived from hollow bones, are known from Eskimo sites in northeast Greenland (*see* Thomsen, Pl. XII, fig. 10; and Mathiassen, 1927, I, Pl. 31, fig. 11).

[500] *See* Nelson, Pl. LI, fig. 4.

[501] *See* his Pl. XXIV, figs. 2 to 20, 47, and 48, and his description on p. 329. Fifteen of these objects are in the Peabody Museum (Cat. Nos. 80468, 80469, 80471 to 80474, 80476*a*, *b*, 80477*a*, *b*, 80478*a*, *b*, 80480*a*, *b*, and 80484).

and breaking. A much decayed and bleached, somewhat rectangular, piece of whale bone, shows cutting and hacking at one end (Number 20, same figure); it is roughly rectangular in cross-section and $\frac{7}{8}$ inch thick. A smaller fragment of bone, $3\frac{3}{4}$ inches long, $\frac{1}{2}$ inch wide, and $\frac{1}{4}$ inch thick, with parallel edges, one of which appears to have been artificially smoothed, is derived from the outer wall of the rib of a sea mammal; it comes from the site at Port au Choix (Cat. No. VIII-A-205). A phalanx of a seal from the site at Bell Burns (Cat. No. VIII-A-271), seems to have the distal joint hacked off.

A small section of antler shows sawing at one end and hacking at the other (Plate XVI, Figure 2, Number 21). The sawed face is smooth and even, and looks almost as if it had been cut with a fine-toothed steel saw, but it could also have been cut with a stone saw; similar cuts can be seen on pieces of stone.[502] The striæ on some of the cuts at the other end look as if they had been made with a chipped stone ax or knife; possibly the antler was softened by boiling before it was cut.

SUMMARY AND CONCLUSION

The sites in northwest Newfoundland are located on low, level sandy benches near safe harbors, high and dry gravelly or sandy points, and, in one case, on a narrow neck of land. Ruins of stone houses were present at only one site, where there is also a row of what may have been "hopping stones" or *nāngissat*.

The inhabitants of these sites subsisted largely on the flesh of animals, of which the following were represented by bones; bear, beaver, otter, seal, whale, and birds, some of the last being those of the Canada goose. The presence of shells of *Pecten grandis*, *Mya arenaria*, and *Modiola modiolus* suggests that these shell-fish also were used as food.

Rocks and minerals occur in the vicinity of the sites and it was not necessary to go far afield to get most of the materials used in the manufacture of artifacts, especially the chert. Nephrite, of which one artifact is made, is the only material that had to be brought from a great distance; at least it is not known to occur in Newfoundland or on the Labrador coast. Animal materials seem to have been sparingly used.

The artifacts of stone are of three different classes; chipped, rough, and smoothed or polished. Those of chipped materials are the most common and consist of sharp-edged lamellar flakes that were probably

[502] Several pieces of slate from a site in Northumberland county, New Brunswick, for example, show this kind of cutting (Cat. Nos. VIII-D-139 *a–j*, and VIII-D-212, Nat. Mus. Can.)

used as knives, leaf-shaped blades (of which the more regularly chipped ones are knives), arrowpoints, notched lance or knife points, a pointed chip which seems to have been a drill, and scrapers. The majority of the arrowpoints are triangular; a few others are notched, and one is stemmed. More than one-fourth of these triangular points retain the original plane of fracture on one face, whereas points of the same type from other "Dorset" culture sites in the Arctic have both faces chipped into shape. More than one-half of them have one face carinated or ridged, others are more convex on one face than the other, and all of them are rather thick, features rarely seen on triangular points from sites of the same culture elsewhere. A few have fine marginal serrations. One stemmed point is of a type widely spread in the Arctic, and also in Canada and the United States. A large, broad point with one edge more curved than the other has a single notch on the less curved edge; others have one notch on each edge, and a few have two or three. There are several different kinds of scrapers, including a few side scrapers with one edge deeply incurved such as are found on the west coast of the Labrador Peninsula, in Greenland, and in Old Bering Sea culture sites on St. Lawrence Island, Alaska. Artifacts of rough stone comprise a broken, pear-shaped, sandstone lamp with a deep well, and several hammer stones made from cylindrical or oval beach pebbles battered on one or both ends. Artifacts of smoothed and polished stone include a few knife or lance heads of slate and chert, the latter being only partly smoothed; a chert chisel-like object, also only partly smoothed; several objects of unknown use, two of which are unique; two adz or scraper blades, one of which is a beautifully finished specimen of nephrite; stone adzes, one of unusual length; and fragments of steatite pots and what were probably lamps. These lamps were apparently semicircular, shallow, and lacking in wick ledges.

Artifacts of bone, antler, and ivory, which were less abundant than those of stone, consist of harpoon heads, a fragment of a bilaterally barbed bird dart point, a possible arrowpoint made from a shark tooth, an awl-like object, needles, needle cases, a possible chipping tool of ivory, an unusual type of socket piece for a compound knife handle, tubular beads, and pieces of bone and antler showing methods of working.

The only evidences of decorative art consist of incised lines on two harpoon heads and on a fragment of a bone object.

None of the sites show any evidence of the presence of Europeans, and they are not those of historic Eskimo, who are known to have made visits to the northern part of the island in the eighteenth century.

Although the results of these brief investigations are too incomplete to permit one to characterize the culture fully, some of the artifacts present characteristics that are sufficiently distinctive to link it with the "Dorset" Eskimo, as defined by Jenness; *e.g.*, the harpoon heads are small and have rectangular sockets, there are no large bone, antler, and ivory objects, some of the chipped chert blades are ground and polished, and the perforations in the artifacts were not drilled but were formed by incising or gouging. As far as can be judged from what has been found, the culture does not seem to be as well developed as in "Dorset" sites in the Arctic.

It is probable that the coasts of the whole northern end of the island were once inhabited by Eskimo of the "Dorset" culture, who may even have ranged farther south than Bonne Bay on the west coast and beyond Notre Dame Bay on the east.

Some of the many interesting problems to be solved in Newfoundland are: Was there an Indian occupation previous to that of the Eskimo and Beothuk? Were the Eskimo of Newfoundland a gouge-using people, as suggested by the finding of gouges in sites that yielded what seem to be Eskimo artifacts? Did they use, or obtain from an earlier people, long, slender stone adzes like the specimen described and illustrated, or were these left by the Beothuk? Was it the Eskimo or the Beothuk that used the long, polished knife or lance points and the grooved stone plummets? It will require several years of systematic exploration in the island before these questions can be solved.

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FACTS AND COMMENTS

A CARVED STONE FROM D'ARCY, SASKATCHEWAN

In recent years, the attention of some archaeologists has been directed to the Canadian Northwest with the expectation of finding some evidence or indication of the early migrations of man on this continent. That man reached North America by Bering Strait from Asia, is generally accepted, but the theory that the migrations took place in late Pleistocene times and by way of an open corridor between the Keewatin ice and the Rockies, requires confirmation. It is significant that Folsom and Yuma points from Saskatchewan, described by E. B. Howard,[503] were found mainly in areas bordering the ancient glacial Lake Regina.[504]

As a further contribution to this problem, it seems desirable to present a brief description of a carved stone relic found in gravel in central Saskatchewan about three years ago.

The stone was found about seven miles southeast of the town of D'Arcy in a gravel pit located on Sec. 9, Tp. 28, Rge. 18, W. 3rd Meridian, on the north bank of a ravine running east into Bad Lake. The pit had been formed by digging into the steep bank about thirty feet from the top and considerable material had been removed so that the upper rim of the pit almost reached the top of the bank. Wesley St. John, a farmer of the district, found the stone partly exposed in the sloping side of the pit about twelve feet from the top and possibly four or five feet in from the original surface of the hill. Careful search of the pit and the immediate vicinity failed to show the presence of any other artifacts or indications of burials. Bad Lake is an alkali flat covering most of the southeast corner of Township 28, which, in some seasons, is flooded but at other times is dry. It has no outlet and appears to have been formed as an intermorainal lake by the melting of the receding Keewatin ice, on that part of the Coteau du Missouri known as the "Bad Hills." The upland, rising about two hundred feet above the lake level, is cut by numerous ravines, containing fresh water springs. It is strewn with boulders and smaller stones which have been used by the Indians to make their numerous tent rings, still to be seen, which indicates that this region has been a favorite camping ground.

The stone is a pink sandstone with narrow horizontal bands, alternately red and grey, which are very distinct when the stone is wet. It weighs eighteen pounds and is about the size of a man's head. Three faces have been chipped out on three sides of this stone, as shown in the accompanying plate. The fourth side appears to have been prepared for the representation of a fourth face. In fact, a start has been made by outlining the eyes by chipping. In the

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[503] AMERICAN ANTIQUITY, Vol. IV, 277–279 (1938).
[504] *Trans. Roy. Soc. Canada*, 1930.

The carved stone from D'Arcy.

top of the stone is a cup-shaped depression, nearly four inches in diameter, and one and three-quarters of an inch deep. The sides of the bowl show regularly-spaced chipping and no sign of wear or polish, while the bottom is uneven and the higher parts show some smooth surfaces. The bowl has evidently not been used as a mortar and probably was intended for some sacrificial purpose or possibly for the mixing of paint materials which produce little abrasion.

The technique shown by this image appears to have consisted in the cutting of parallel, perpendicular and horizontal grooves, by means of a sharp narrow chisel or graver, possibly made of flint or quartzite. Such a process leaves square projections between the grooves where they cross each other. The projections could then be easily chipped out and the grooving process repeated. The faces show that the final process was that of rubbing and polishing to obliterate the graver marks.

The primitive sculptor shows ingenuity and a measure of artistry in obtaining individuality of expression with the minimum of effort, which he accomplished by cutting into the stone to produce the necessary relief. Thus, the forehead, tip of the nose, cheeks and chin, are in the same plane, which is the specially prepared surface of the stone.

The faces show some noteworthy peculiarities. The middle one appears to have received the most attention, and is hawk-nosed, with the tongue sticking derisively out to the side of the mouth. The deeply-marked eyes have round pits for pupils and the eyebrows are indicated by curved grooves above. The two side faces are characterized by wide flat noses, square pupil pits in the eyes and shallow wide grooves representing teeth. The latter may have contained shell or semi-precious stone insets. One face has a deep indentation in the lower lip which may have been used for the insertion of a pipe stem or a protruding tooth, examples of which may be found in the Maya carvings of some of their gods.

The origin of this carved stone has not yet been determined and since extensive enquiries in this Province have not brought to light stone objects showing similar technique, it may be necessary to consider the possibility that this carving was brought in from some distant part of the country, such as the Pacific Coast or Mexico. The opinion of archaeologists familiar with the art of these areas would be welcomed.

Stone carving is not mentioned by the explorers and fur traders as being a characteristic art of the Plains Indians about two hundred years ago. Thus, we may be justified in suggesting that some prehistoric tribe, such as Folsom or Yuma man, may have made this carved relic on the banks of the old glacial lake where it was found. It may even be an isolated indicator of the early migrations that are supposed to have taken place through the ice-free corridor of the plains.

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STONE MAULS OF THE NORTHWEST PLAINS REGION

Distinct types of grooved stone mauls are so common in the northwest prairie states that they deserve a brief description.

South Dakota appears to be about the center of the area in which they are found. They are common in North Dakota and the southwest corner of Minnesota, the northwestern part of Iowa, Nebraska, and the eastern parts of Wyoming and Montana. Those found outside of the above area were probably exchange pieces traded with neighboring tribes. These stone mauls seem to be as common in the northwest prairie states as the grooved stone ax is in the woodland region southeastward. In the earlier days they were commonly used as door stops in the cabins of the pioneers; farmers fastened two together with rope or wire and used them as windbreaks on hay and grain stacks. Every private collection contains several, and nearly four hundred have accumulated in the University of South Dakota Museum without special effort to collect them. The writer has found them along fence rows in piles of stone that had been carried from fields. This type must not be confused with the Sioux Indian chokecherry crusher or the Sioux Indian war club, the latter made and used only as an implement of warfare from about 1864 until 1880. These were double cone shaped, small and of uniform size.

The shape of the stone maul varies as does that of all pre-historic stone artifacts; some are oblong, others egg-shaped. Many of the above types are square or flattened at the large end, and some are flattened at both ends. A few are distinctly cone-shaped and long with the larger end square. See Plate XVIII, Fig. 1,*c* and Fig. 4.

One hundred were taken at random from the museum collection, measured and weighed. The average length was slightly less than six inches. The average weight was five and three-quarter pounds or about twice the weight of a steel axhead; thirteen weighed from nine to fourteen pounds. Two specimens not in the sample include one well-shaped maul that weighs sixteen pounds and another, perfect in form, that weighs only three ounces.

The material used was selected from the glacial boulders of granite, quartzite, diorite, and basalt, which are common over the glaciated area of the northwest. The fact that in many instances, aside from the groove, very little shaping or work was required to form a crude maul, accounts to a certain extent for their variable forms. Occasionally, one is found in or near the Black Hills made of quartz. Surprisingly few are made of the reddish quartzite which is so common up the eastern third of the state, however this stone is very hard and of a texture difficult to work by the pecking process used by the primitive Indians.

Stone mauls, due to their size and lack of workmanship may not be classed as an attractive artifact. Only a few show any degree of polishing or ornamentation. One, Plate XVIII, Fig. 1,*b* has five wide, shallow longitudinal grooves on the large end; another, from Deuel County, has a Greek cross in single lines on the side. One of the cone-shaped mauls found in McCook County shows an

Fig. 1

Fig. 2

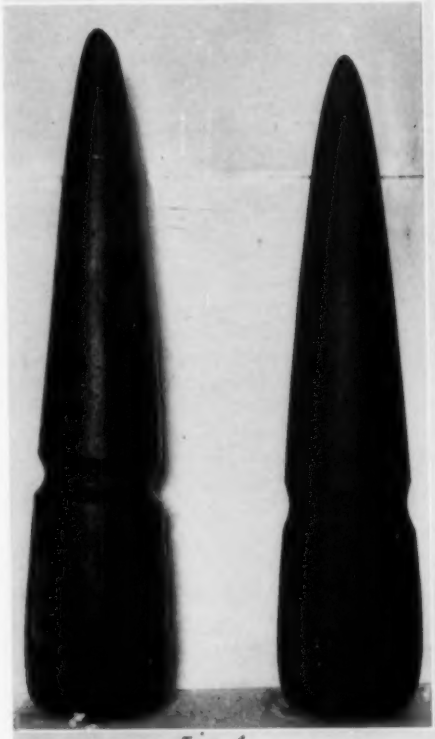

Fig. 4

Fig. 3

Fig. 5

Stone Mauls of the Northwest Plains.

embossed ring on the side. About one dozen with a double groove have been found, mostly from Edmunds County. See Plate XVIII, Fig. 3. No practical use can be seen for this double groove and as most of the mauls with this type of groove have been found in a restricted area it is probably an individual characteristic. The cone shaped maul is rare, not more than a dozen have been found in the eastern part of the state. The two illustrated in Plate XVIII, Fig. 4, are sixteen inches long and are of hard black stone with a fine texture. One shows some polishing. Others range in length down to seven and one-half inches (Plate XVIII, Fig. 1,*c*). A single specimen of the monolithic type, found in Hutchinson County, and illustrated in Plate XVIII, Fig. 5, is a little over seven inches long. It is made of greenish diorite. The handle is only slightly longer than the head.

The grooves around the mauls are usually deep and well-defined and mostly placed nearer the poll end. As the grooves were for the purpose of attaching a handle, this position would offer a more balanced swing to the implement. For an implement of such weight, the handle would necessarily be long, at least as long as the handle of a wood-chopping ax.

It is noticeable that the larger mauls have rounded bases while flat bases predominate in the smaller ones. It is also evident that more of the larger ones are found scattered over the plains and not near a known village site, while the smaller ones are more apt to occur near villages and on floors of old lodge sites.

To what extent their distribution over the prairies can be attributed to the later Plains Indians who would have found and used them is also a question. There are two mauls in the Museum collection, each weighing seven and one-half pounds with handles attached. These were procured from a very old Sioux Indian on the Pine Ridge Reservation about 1900, who admitted that he had found the mauls, fastened on the handles and was using them around his camp (Plate XVIII, Fig. 2).

The theory that they were used by these so-called early "Moundbuilders" for tethering horses would appear to have no foundation as there is no evidence of the presence of horses in the lodge floors or mounds. It is also suggested that they may have been used for dispatching buffalo that had been wounded by arrows or maimed by driving them over high banks. It is more than likely that they were general utility implements, whether for the chase or around the villages.

W. H. Over
University of South Dakota

CORRESPONDENCE

NOTES ON A POTTERY TYPE CALLED LINO GRAY

Archaeologists working in the Southwest frequently attempt to use the type called Lino Gray as a time indicator and discuss at length its failings. Lino Gray can be used as a time indicator for the Lino Focus, Basket Maker III of Kayenta Branch, only if its character is fully understood. All sherds of a Lino Gray Jar will not tell the story.

In the Kayenta Branch of the Anasazi root, when annular fillets, and corrugation as decorative techniques were first introduced they were applied to the neck of jars only. The body of the vessel remained plain, just like Lino Gray. However, Lino Gray jars have a characteristic neck, and if the rim sherds are present, Lino Gray can be identified. No weight should be given to body sherds unless accompanied by rim sherds. This is because the following types have plain unpolished body sherds.

Lino Gray—500?–700 A.D. Jars with plain vertical neck, not outflaring. Plain body.

Kana-a Gray—700–875 A.D. Jars with vertical neck with wide annular fillets. Body plain.

Coconino Gray—850–900 A.D. Jars with neck with fine corrugations, often emphasized with tooling marks. Body plain.

Medicine Gray—875–925 A.D. Jars with neck with indented corrugations. Body plain.

O'Leary Tooled—850–900 A.D. Jars with neck outflaring, tooled with short vertical indentations in horizontal rows.

Kiet Ziel Gray—1274–1300 A.D. Jars with neck outflaring. Neck and body plain.

For further details of these types see Colton and Hargrave, *Handbook of Northern Arizona Pottery Wares*, Museum of Northern Arizona, Bulletin 11, 1937. Besides these, there are other undescribed types with body sherds similar to Lino Gray from other regions.

To recognize Kana-a Gray, Coconino Gray, and Medicine Gray it is necessary to find sherds that are part coiled or corrugated and part plain. As the sherd is apt to break on the line separating the coiled neck from the plain body, these sherds are not as common as they should be, which adds to the confusion.

You can see by this, that only if whole pieces of pottery are available, or if neck sherds are present, can Lino Gray be used for dating. The characteristic body sherds might range in time from 500 A.D. to 1300 A.D.

HAROLD S. COLTON
Museum of Northern Arizona

REGARDING SANDIA CAVE

[Editor's note: Manuscript for the article "A Chronological Problem Presented by Sandia Cave, New Mexico" by Wesley L. Bliss which appeared in the last number of AMERICAN ANTIQUITY had been in the files in the editor's office for somewhat more than a year before it appeared in print. During that time developments have taken place which invalidate certain of the statements made by Mr. Bliss. Dr. Donald D. Brand has kindly consented to explain the situation.]

The appearance of "A Chronological Problem Presented by Sandia Cave, New Mexico," by Wesley L. Bliss, in the January 1940 number of AMERICAN ANTIQUITY calls for some comment. Mr. Bliss worked for a brief period in the somewhat disturbed front portion of the Sandia Cave a little more than three years ago. The subsequent seasons of excavation, under the direction of Dr. Frank Hibben, have shown conditions considerably at variance with Mr. Bliss' conclusions, which were founded upon insufficient observation. Mr. Bliss' stratigraphy is incomplete and that which is stated is incorrect. There is no evidence of rodents having broken through the stalagmitic layer as stated in the article. There is, on the other hand, definite evidence that the entrance to the cave was sealed at least once during its history.

It will be impossible to correlate the strata in the cave with other Pleistocene deposits until a study of the stratification in surrounding caves can be made. After three years of work in the cave, we have still considered our data insufficient to publish on the stratigraphy until we have completed at least one more season.

Mr. Bliss has not been connected with the University of New Mexico since his return from the 1937–38 field expedition in Western Canada and Alaska.

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NOTES AND NEWS

MICROFILM SETS OF PERIODICALS

The Committee on Scientific Aids to Learning, President Conant of Harvard, chairman, has made a grant to cover the cost of making a microfilm master negative, on the most expensive film, of sets of volumes of scientific and learned journals.

This permits the non-profit Bibliofilm Service to supply microfilm copies at the sole positive copy cost, namely 1 cent per page for odd volumes, or a special rate of ½ cent per page for any properly copyable 10 or more consecutive volumes.

The number of pages will be estimated on request to: American Documentation Institute, care offices of Science Service, 2101 Constitution Ave., Washington, D. C.

COMMITTEE ON EXCHANGE OF PUBLICATIONS

Members of the American Anthropological Association, the American Folk-Lore Society, the Society for American Archaeology, and the American Association of Physical Anthropologists, may apply for reprints of publications in the *American Anthropologist*, the *Journal of American Folk-Lore*, AMERICAN ANTIQUITY, the *American Journal of Physical Anthropology* and the *International Journal of American Linguistics*, to Dr. Elsie Clews Parsons (320 East 72 St., New York City), Chairman of the Committee on Exchange of Publications by Individuals, AAA. The Committee will endeavor to act as a clearing house not only for reprints but, whenever possible, for other publications by members of the respective societies.

NORTHEASTERN AREA

Maurice Robbins, President of the Massachusetts Archaeological Society, sends the following note:

"During the last of 1939 a group of nine members of the Massachusetts Archaeological Society worked on a village site, identified in the survey of the society as M-39-64, and located in the city of Taunton, Massachusetts, on a dried up river bed which once flowed into the Taunton River system through Winnecunnet Lake. Only a small part of the site was excavated, so small a part that one does not feel able to speculate on the culture as yet. Suffice it to say that the site seems to be fairly rich and bids fair to solve certain problems of the prehistory of the Taunton River basin. As soon as the weather permits it is the intention of this group to commence work on this site for the 1940 season."

Dr. J. Alden Mason, in an article entitled "Archaeological Work in Montgomery and Chester Counties" published in *The Pennsylvania Archaeologist*,

Vol. X, No. 1, reports on a survey of the Philadelphia region and the Schuylkill River and affluents. Although a number of sites on the river were tested, nothing but a superficial deposit was discovered; no evidences of disturbed subsoil were found. The survey is to be continued.

Dr. Frank G. Speck has been continuing his ethnological and linguistic studies among remnant groups of Eastern Algonkian in New England, Ontario, and Kansas. (*W. A. R.*)

NORTHERN MISSISSIPPI AREA

During 1939, research necessary to further clarify the cultural sequence observed in the vicinity of the Falls of the Ohio has been concluded. Because of a century and a half of repeated inundation and consequent surface dissection and erosion, much of the once prolific evidence of the later occupational levels had been obliterated. Through a careful study of material found in various museums and private collections, known to have come from these sites, it has been possible to reconstruct satisfactorily the material culture of the disturbed deposits.

It may now be stated with assurance that the successive occupations at Ohio Falls were as follows:

1. An occupation upon glacial outwash clays, and upon the marl floor of a receding Pleistocene lake, of a group possibly related to (2), following. The stratum is almost entirely composed of the shells of small molluscæ, with included bones of fish and waterfowl. The stratum has revealed sparse, crude artifacts, and no human remains. Because of its depth, it has been as yet insufficiently studied.

2. An extensive occupation by the group first described by Moore at "Indian Knoll," upon Green River, Kentucky. The Ohio Falls sites represent, so far, the most important concentration of this group reported. In our opinion, the pattern is here unspoiled by contact with other peoples.

3. An occupation by a southern group having much in common with the Gordon-Fewkes peoples of Myer and Swanton, but with a characteristic "slate complex" somewhat unique. The use of pillow-like head supports of slate, in burials, is typical—as is its utilization for agricultural and other implements.

4. An impressive occupation by another southern group, who built rectangular house structures, and later burned them, erecting mounds thereupon; who made effigy pottery, used copper extensively, and who in this region had an obvious contact with the Fort Ancient peoples of Madisonville.

5. Scattered occupations, represented by camp debris (including artifacts) of historical Indians—probably both Shawnee and Delaware (Munsee).

Fieldwork for the year was confined, of necessity, to an investigation of a few sites whose study has concerned our general, and larger, problem. These have included certain shell mounds upon East White River, Lawrence County, and the so-called "stone fort," on Ohio River, Clark County. The former sites

are definitely "southern" in perquisites, and throw considerable light on the Ohio Falls problem. The latter, a hilltop, fortified, enclosure, includes as part of its plan a series of stone mounds integrated with its defensive stone walls. Within the enclosure was a village with circular house structures, much workshop debris, numerous mortars cut from exposed limestone strata, etc. Conclusions thereupon are as yet somewhat indefinite. (*E. Y. Guernsey*)

SOUTHEASTERN AREA

The Fourth Southeastern Archaeological Conference was held at Ocmulgee National Monument, Macon, Georgia on November 10th and 11th. In attendance were some 30 research workers in the Southeast and representatives from three northern institutions. The program included a tour of the Macon and Lamar sites, and papers and discussions on the several archaeological problems of the Southeast. Abstracts of the papers will appear in a forthcoming issue of the News Letter. Louisiana State University at Baton Rouge is host for the next conference, which will be held around the first of next September. James A. Ford will preside as chairman. (*J. Joe Finklestein*)

The palisade discovered at the Lamar site, Ocmulgee National Monument, and reported in Vol. V, No. 2 of this series has proved to extend for 3560 feet around an area of twenty-six and one-half acres. A report on the excavation and restoration of the Ceremonial Earth Lodge is in preparation. (*John C. Ewers*)

SOUTHWESTERN AREA

The University of Arizona continues two projects of some standing, an examination of proto-historic archaeological sites in the Papago country, and additional work on the University Ruin.

Pueblo Grande reports completion, with W.P.A. help, of the survey of areas in the vicinity of Phoenix which are scheduled for cultivation, with a total of 94 sites. Fifteen trash mounds, stratigraphically tested, range from Estrella to Civano, with the Pueblo Grande Mound dominantly Civano but some Soho-Civano transition in upper levels. Intrusive sherds are largely from the Flagstaff area and some from the Tucson region.

Evaluation of work by Nesbit, of Logan Museum, on Mogollon culture sites near Reserve shows Wheatley Ridge Village to be Three Circle. One of the fourteen houses dug was a ceremonial pit structure 31 by 28 feet with a stepped lateral entry 10 by 30 feet. Burials were found without mortuary offerings, apparently a Mogollon trait.

J. O. Brew writes concerning the Awatovi Expedition that the work on sites in that section from B.M. III through P. III, including digging one good

sized B.M.III-P.I village, showed tie-ins with Allantown and also sites on the Mogollon Rim. Subterranean houses, not kivas, as in the Flagtaff area, survived late. Surveying in the Jeddito Valley and Antelope Mesa located over two hundred sites.

The National Park Service has undertaken stabilization in the Upper Tonto Ruin as one unit of a continued project. The University of New Mexico continues work at Pecos, Quarai, and on the Coronado State Monument, where a museum and ethnobotanical garden are being installed.

Of most interest is the work reported by Earl Morris in the Durango, Colorado, area. Here he found intense occupation from what was a culturally primitive B.M. II horizon until late in B.M. III. In 1938 he worked a cave representative of the earliest stage, during the past summer, sites toward the end of the cycle, and hopes next year to get the stages between. He feels very hopeful that when the quantities of charcoal from the cave are dated they will show dates "back somewhere around the year one." This hope is now based on the culture stage alone, but if his dating proves correct it will represent the earliest definitely dated culture in this country.

One of the recent interesting projects in the Southwest is the examination of the archaeological and ethnological problem of the Papago country, now being carried on by the Arizona State Museum. Researches are intended in all phases of anthropology, as regards this little known region. Beginning with ethnology, linguistics, and present-day studies of physical anthropology, an effort is being made to work back through old Papagao sites, through the Spanish series, and into prehistoric sites.

The ethnological work is organized and financed solely by the State Museum, in an effort to supplement the work done in this area, and on this group, by Russell, Ruth Underhill, and others, while the archaeological work is sponsored by the State Museum, but financed through the C.C.C.—I.D. In the results of the second season of digging it is possible to point out certain factors: known archaeological horizons extend from about 800 to 1400 A.D. followed by a break in the sequence of about 300 years; the second series begins in about 1700 A.D., and extends to the present. From 1700 on, Spanish objects are found in sufficient numbers to establish horizons.

In general, the culture in the early part differs from that of both the Gila Basin and the Santa Cruz areas, each of which have been previously studied. Archaeological work in this section is difficult, for remains are shallow and scattered. When the study is completed it should fill an important existing gap in the prehistoric and historic knowledge of the Southwest, and perhaps shed some light on the late history of the Hohokam, or the genesis of the Papago-Pima. (*J.C.McG.*)

The archaeological work of the University of Utah Museum of Anthropology, Salt Lake City, for the season of 1939, was carried on in caves and open sites in the vicinity of Deep Creek Valley and Desert Range of mountains in western Utah, under the direction of Elmer R. Smith, Curator, and Instructor in Sociology and Anthropology.

The information gathered from the vicinity of Wendover in the Desert Range region, established at least four periods of ancient habitation for that area: (1) Modern Shoshonean; (2) Promontory culture (first established by Julian H. Steward in 1931) which consisted of Promontory pottery, baskets, flint and obsidian implements and weapons and one stone slab-lined cist; (3) Puebloid horizon with characteristic Great Salt Lake Puebloid pottery, basketry, stone weapons and implements, bones of animals such as buffalo, deer and antelope, and plants and plant seeds of various species; (4) Pre-Puebloid culture consisted primarily of stone implements and five cists made by lining small excavations in the floor of caves with adobe, grass and cedar bark. Fire-pits, outlined with rocks, were found in sites of all the cultures except the early pre-Puebloid. In cave site U-145, five fire-pits were located either on or within five inches of Lake Bonneville gravels, the specific dates of which have not been established.

In the vicinity of Deep Creek, which is on the present Goshute Reservation, an archaeological reconnaissance showed mixing of the Sevier and Great Salt Lake Puebloid pottery wares and also established the fact that this was the center of modern Shoshonean habitation, since modern Shoshonean pottery, metal arrow points, stone Goshute points and two skeletons of Indians from the period following white contact were found. In Tunnel Canyon, 20 miles to the west of Deep Creek, a large number of red pictographs, painted on the walls of the canyon, were mapped, drawn and photographed.

The reconnaissance of the area west of Wendover seemed to indicate that the Great Salt Lake culture did not extend beyond the high mountain ranges to the west.

Other areas in Utah were studied during part of the 1939 season, including Stansbury Island, a survey of which established the fact that the caves in that vicinity were inhabited for some time by at least three different cultural groups. Five skeletons from the east shore of the Great Salt Lake Region have been obtained by the Museum through the coöperation of individual farmers and the Davis County Sheriff's office. These skeletons are of the Puebloid type.

Caves on the south shore of the Great Salt Lake, in the vicinity of Magna, have yielded evidence of post-contact, Promontory, Puebloid, and pre-Puebloid or late pre-Puebloid cultures.

East of Hoytsville a Puebloid site was located which yielded a number of potsherds and points. In the same area a number of caves showing evidences of habitation were located.

An open promontory culture site has been located at the mouth of Weber

Canyon; the site was mapped and the artifacts were studied. Also, from the east shore of Utah Lake some 4000 specimens of pottery, bones, and stone artifacts have been excavated, studied and photographed.

The field work completed this summer has made possible the filling in of some of the early history of the Great Basin, such as the establishing of the contemporaneity of late Puebloid culture and early Promontory culture. (*E. R. Smith*)

A report of the field work of the Colorado Museum of Natural History under the direction of Betty Holmes Huscher, assisted by Harold A. Huscher, is included in the Annual Report of that institution, just released. The season (1939) was spent in continuation of surface survey for nomadic, or open, sites showing promise of stratigraphical sequence, and for sites for which direct historical identifications are possible. Most of the work was done in the San Luis Valley (Upper Rio Grande) and in the Lower Gunnison River drainage.

At a site in Escalante Canyon, a ten-foot vertical section showing continuous deposition of camp debris was revealed, time interval unknown, probably considerable. A number of other deep hearth exposures were recorded, but nothing definite is known about any of them.

Surface survey was rewarded by the location of five Ute game traps of the chute and pound type. Constructional differences may or may not represent band variation.

Tree-platform occurrences were checked in three communities; the local opinion that these are burial platforms was not substantiated; they are more likely hunting platforms.

Twenty-one Ute wikiup sites were located and surface collections made. All should antedate the 1880–81 removal. In 39 individual examples, wikiups were in sufficiently good condition for one or more constructional details to be recorded. Since some of the wikiup poles should be dateable, we may have here a positive method of checking development of the horse-culture of the Utes within the last two hundred years.

Especial attention was paid to "stone circles" or "Indian forts" which occur consistently in exposed places; all were clearly vulnerable to attack from nearby higher ground. These circles are in no way to be confused with tipi-rings; dry-laid masonry walls two to three feet high are still standing in several instances. A plausible explanation for such circles, is that they are some sort of "proto-hogan," possibly recording prehistoric Athapascan movements.

One small Pueblo ruin was located on Escalante Creek, just outside the Kidder-Roberts Pueblo boundary. Potsherds and arrowheads check with the Woodburys' San Miguel Paradox Valley sites.

Petroglyph sites were examined and recorded wherever possible. Conventionalized bear-track designs were recorded from two sites, presenting plausible evolutionary series leading up to the triangular bear track-tipi design element (parfleche-painting, beadwork, etc.) of montane and neighboring tribes. Occur-

rence of bear-track petroglyphs with horse petroglyphs and with wikiup remains, makes it increasingly likely that the Utes are responsible for them. (*Harold A. Huscher*)

The Nevada State Park Commission has assembled a considerable amount of data relative to the archaeology of the state. Persons interested may write to Robert A. Allen, Superintendent, Nevada State Park Commission, Carson City, Nevada. If requested data are not at hand, the inquirer will be referred to sources from which they may be procured. (*S. M. Wheeler*)

PACIFIC COAST AREA

The field work of the University of Oregon, carried out by a party of ten, which spent six weeks in the field had two objectives: (1) the verification of the stratification series in certain caves in the Summer Lake region where levels of occupation were separated by pumice from the eruption which was instrumental in the formation of Crater Lake, and the testing of certain other caves in the same region, and (2) reconnaissance in the extreme southeastern area of the state where an arm of Pleistocene Lake Lahontan extended close to the Snake River drainage by way of the Owyhee River. It was hoped that in this area we might find evidence that would enable us to tie in the sites found further to the west with Shoshonean traits which might have come in by way of the Snake River drainage.

Complete excavation of the caves in the Summer Lake region verified the conclusions drawn from the work done in 1938. Further work proved the existence of stratification in a cave in which it had not been found in 1938, but in which it had been suspected because of the existence of a perfect example of stratification in a cave immediately adjacent.

A test pit in a cave close to these other two, showed the characteristic pumice stratification, but in addition provided the remains of an old camp site with partly mineralized bones and two obsidian artifacts resting on the sand and gravels of the top beach of the old lake at a depth of something over six feet from the present surface of the cave and underlying a sterile layer below the pumice stratum. Among the bones, broken in many cases for their marrow, were those of native horse and camel, indicating the late Pleistocene or early Recent character of the site. There were some six or seven other genera and the bones of waterfowl in the series. This cave will be excavated during the coming summer.

Two weeks of intensive exploration in the old Lahontan hydrographic basin failed to indicate any occupied caves and no surface sites insofar as the Oregon area is concerned. The amazing thing about the area is its almost complete lack of even surface "finds" in Oregon, although further south, in Nevada, the prospects would appear to be very good for rich sites and occupied caves.

Following two weeks in this region, the party moved to the west to check the Alvord Valley which lies between the Lahontan area and the Catlow Valley region to the west. Here, surface sites and a number of caves were found. Over nine caves were examined by test pits, and in two of these, occupation was found on ancient gravels. There is reason for believing that the situation was similar to that in the caves to the west, where evidence has now been produced showing the presence of man in this region shortly after the recession of the water of the lakes from the high beaches and at a time when the horse and camel, considered more characteristic of the Pleistocene than the Recent period, were to be found in this area.

Work will be carried on for six weeks in the summer of 1940, extending this work to other areas in this region. (*L. S. Cressman*)

The edited draft of the news note on Coulee Dam archaeology that appeared in AMERICAN ANTIQUITY, Vol. V, No. 3, omitted the name of Robert L. Stephenson. When Krieger left for Texas late in July, Stephenson, who had been engaged with L. S. Cressman in Oregon and Nevada, agreed to continue the Coulee investigations until a permanent supervisor could be secured. He was in complete charge from July 20th until Drucker took over in September; after this he returned to classes at the University of Oregon. He was almost entirely responsible for keeping the program alive until the NYA project was initiated, and deserves great credit for his able conduct of all aspects of the work, without remuneration other than experience.

Numerous changes in personnel have occurred since then, but the work is still going on, despite inclement weather. Cultural material is rather meager, but interesting enough to be worth while. Mr. Joe Jablow is now in charge, having succeeded Dr. Drucker, who left for Vera Cruz in December. (*Alex D. Krieger*)

The projects of the Southwest Museum during 1939 were three in number: Mr. E. F. Walker carried on excavations in a pre-contact cremation area near Chatsworth, securing an extensive collection of stone bowls and other utensils; Mr. S. M. Wheeler undertook a brief reconnaissance in eastern Nevada; and Mr. M. R. Harrington conducted a reconnaissance of northern California in search of further data on the early types of implements found at Borax Lake in 1938. Similar objects were observed near Alturas, in northeast California, and near Eureka, in the northwest part of the state. (*M. R. Harrington*)

MIDDLE AMERICAN AREA

Dr. Donald D. Brand of the University of New Mexico, together with six graduate students, spent the months of June, July and August, 1939, in an archaeological reconnaissance in certain almost unknown areas of south central and southwestern Mexico. The other members were Carolyn Miles, Marjorie

Flinn, John Goggin, Robert Lister, Douglas Osborne and William Pearce, the latter of the Texas Institute of Technology. They were also accompanied by Hugo Moedano, graduate student at the Universidad Nacional de Mexico. The first two devoted their time principally to the study of archives of the 16th and 17th centuries pertaining to the region of Guerrero and Michoacán, the field of interest of the expedition. The work was exploring and reconnaissance, and at no time was any excavating done.

The first month was spent in visiting known archaeological sites and areas in the Valley of Toluca, Michoacán, and northwestern Guerrero, and in studying museum collections from regions to the north of their primary area of interest, the middle Rio Balsas drainage in northwestern Guerrero and southern Michoacán. During this survey a number of new sites were located and surface collections made; two of these are near Lago Cuitzeo and on the southeast shore of Lago Chapala.

During July each of the five men investigated one area of the Rio Balsas drainage. Also an aerial reconnaissance was made over southern Michoacán during which a number of very large ruins were located on the tops of seemingly inaccessible mesas at some distance from the nearest present habitations. At the close of their field work the party attended the International Congress in Mexico City and reported upon the work.

In addition to archaeology, observations were made on land forms, geologic structure, vegetation, native economy and ethnology. The native languages of the region have been almost entirely replaced by Spanish. It is outside the Tarascan area. Mexican (Nahuatl, Aztec), strong in the eastern part of the area, dies out in the west, though there are survivals of Nahuatl garrison-colonies to the north of the Balsas in northwestern Guerrero. Some Cuitlateco were encountered but no trace of the Tlacotepegua.

Most of the time was devoted to the determination of ceramic types from surface finds and existing collections, and the locating of various types of structures. The ceramic material, which is now being studied, indicates that the Valley of the Balsas proper had in general rather poor pottery with a high incidence of monochrome ware and relatively little polychrome ware. The use of an open handle-like loop as a foot in the rather common tripod forms is characteristic. Several new types of ceramics were found. There was very little influence from Colima-Jalisco into southwestern Michoacán, and little Tarascan influence from the north into the central Balsas area. Some Matlatzinca influence south from the Valley of Toluca, and Aztec II influence from the northeast as far as Ostuma were noted.

The ruins varied from potsherd-areas to huge masonry fortresses. As far west as Zirandaro, with an increase in incidence eastward, stones with glyph-like carvings were found as isolated slabs, or on rocks built into the masonry structures. Tumuli, normally earthen mounds, are most plentiful in southwestern Michoacán. Truncated wedge-shaped pyramids, with buttresses and stages,

are rather common in the central and eastern parts of this area. Some of these reach fifty to seventy feet in height; some seem to be made almost entirely of earth, others of rubble, and some seem to have been faced with cut rock or river pebbles. Some pyramids showed evidence of the use of stucco, normally white, and on some of these stuccoed surfaces were painted murals in several colors. In some of the pyramids there seem to have been rooms and passageways that were later filled up. The larger stone-faced pyramids are mainly in the valley proper of the Balsas between Zirandaro and Tetela del Rio.

Clay elbow-pipes preponderate in southwestern Michoacán; the quality of obsidian work in the southwestern half of the Balsas drainage is poor as compared with that in the northeastern part. Rather archaic figurines are found in the northern portion of the Sierra Madre del Sur. There is evidence of various modes of disposal of the dead within the same area, probably explicable as a temporal differentiation.

Although the party did not cover the narrow coastal zone between the Sierra Madre del Sur and the Pacific Ocean, no evidences were seen of the extension of Central American influences up the west coast of Mexico, which thesis has been suggested by other investigations. But the major lines of cultural and trade movements within the Rio Balsas area can probably be worked out from the data secured. It is indicated that there were several local cultures which, at a comparatively late date, were influenced slightly by the Tarascans from the north, and more strongly by the peoples and cultures of the Valleys of Toluca and Mexico to the northeast. Dr. Brand believes that the bulk of the large structures in the Rio Balsas Valley were not of Tarascan origin, but were much earlier than the brief period of Tarascan conquest.

I am indebted to Dr. A. V. Kidder for the following report of the recent archaeological work of the Division of Historical Research of the Carnegie Institution of Washington.

Copan. "Excavation and repair of the ruins of Copan, a project jointly financed by the Government of Honduras and Carnegie Institution of Washington, continued under the direction of Gustav Stromsvik assisted by Stanley Boggs. Temple XI, partly cleared years ago by Maudslay and further excavated by Aubrey S. Trik in 1938, was worked on by Mr. Boggs, who strengthened the temple's foundation on the north side and discovered a new and well preserved hieroglyphic inscription flanking one of the temple's doorways. Mr. Stromsvik continued repair of the Hieroglyphic Stairway, replacing a number of carved blocks of which the exact former position is unknown, but which, lying scattered at the foot of the stairway, were exposed to serious damage. These stones are being set in such a way that future students cannot confuse them with the steps actually found in place. In their present location they not only are safe from harm, but serve to restore to the stairway much of its original grandeur.

"Miss Tatiana Proskouriakoff spent several weeks at Copan gathering ma-

terials for a series of drawings which will convey much more clearly and graphically than can be accomplished by any other method the probable appearance of the various buildings as they existed during the city's occupancy.

"J. M. Longyear devoted a second field season to study of the pottery of Copan. In 1938 he had identified the major local types and had determined the succession of the principal ceramic periods. The present year, additional test pitting and trenching netted some 20,000 more potsherds. Among them are many of sufficient size to give better information than had previously been available regarding the shapes of vessels and their decoration. They also included a number of pieces of non-local manufacture which throw light upon chronological relations and trade contacts between Copan and other cultural centers both within and without the Maya area.

"Miss Anna O. Shepard was at Copan in April to gain firsthand information as to archaeological and geological conditions in the valley, and to make preliminary technological observations on the pottery.

"During the season, the Government of Honduras constructed at the modern town of Copan a museum to house the pottery and other small specimens found in the excavations, and such finer pieces of sculpture as require protection from the weather. The museum building, erected under Mr. Stromsvik's supervision, contains exhibition halls, library, laboratory, and storage rooms.

Vera Cruz. "The cooperative survey of archaeological sites in southern Vera Cruz being carried on by the Mexican Government and Carnegie Institution went forward under direction of Lic. Valenzuela and Mr. Karl Ruppert. Excavation of numerous mounds yielded interesting data on architecture, ceramics and stone carvings. And while the collections, especially the pottery, have not been sufficiently studied to permit definite conclusions, there is indication of connections with Monte Alban in Oaxaca, Teotihuacan in the Valley of Mexico, the Huastec district of northern Vera Cruz, and Kaminaljuyu in the Guatemala highlands.

"At the close of the field season in June, Mr. Ruppert visited Tapachula Chiapas, near the Guatemala border, to examine Izapa, a large and apparently important site containing a number of carved stone monuments.

Other Activities. "Messrs. Pollock, A. L. and R. E. Smith, O. G. Ricketson, and S. G. Morley devoted the year to preparation of reports. A. V. Kidder studied collections in Guatemala and made a short reconnaissance trip to sites in central and eastern Honduras." (*J. A. M.*)

SOUTH AMERICAN AREA

Dr. A. Kidder, II of the Peabody Museum, Harvard University, has returned from a field trip to the southern highlands of Peru. The ruins of Pucara, in the Department of Puno, proved so extensive that six months of mapping and excavation were barely sufficient for a representative cross section of the

site. Very little survey work was done in the region and no excavation in the Arequipa district, as originally planned.

Pucara was at one time a large and important center, as attested by extensive rubbish deposits, numerous mounds, stone buildings and carved monoliths. The earliest pottery is obviously related to that of Classic Tiahuanaco of Chiripa, in Bolivia, but forms a definite and hitherto scarcely known local type. Most statues apparently belong in this period. The succeeding ware is a crude, poorly painted type, in turn followed by Inca sherds on the surface and in the superficial deposits.

Excavated architectural remains include a large cut stone temple with a sunken central enclosure containing grave chambers on four sides and an upper surrounding complex of rooms, altars and paved entry ways. Simpler domestic buildings were also exposed.

The site suggests a center of a northern Puno phase of Titicaca basin culture, comparable to Tiahuanaco to the southeast. (*A. K., II*)

BOOK REVIEWS

Starkweather Ruin: A Mogollon-Pueblo site in the Upper Gila area of New Mexico, and affiliative aspects of the Mogollon Culture. PAUL H. NESBITT. (Logan Museum Publications in Anthropology. Bulletin No. 6, The Logan Museum, Beloit College, Beloit, Wisconsin. 1938. Pp. 143. 6 text figures, 50 plates.)

A few years after Gladwin recognized the Hohokam as a culture distinct from the Pueblo, he pointed out that there were sites in west-central New Mexico which did not fall within the definition of either. He proposed a third major division of Southwestern culture which is now called Mogollon, and which he thought showed influence from the east. In 1935, Haury excavated the Mogollon and Harris sites in west New Mexico for Gila Pueblo. The publication of Haury's paper in 1936 provoked considerable discussion as to whether or not this Mogollon culture was as basic as Hohokam or Pueblo. To make a contribution in this field, Paul H. Nesbitt excavated for the Logan Museum of Beloit College a site near Reserve, Catron County, New Mexico. The site consisted of a masonry pueblo surrounded by groups of pit houses of earlier age. He excavated, besides the pueblo, eighteen of the pit houses.

The report on these excavations is divided into two sections; in the first section, the author discusses in six chapters, the architecture, disposal of the dead, and burial customs, physical types, material culture and chronology. In the two chapters of the second section, he deals with the theoretical considerations. This is followed by a useful appendix presenting brief descriptions of fourteen pottery types and a bibliography.

The importance of this paper lies in its being the first attempt since Haury's paper (Medallion Paper No. XX) to evaluate the Mogollon Culture.

The author resolves the problem into several possibilities:

a) That the Mogollon culture is a variant of Basket Maker-Pueblo;
b) That the Mogollon culture is a variant of the Hohokam;
c) That the Mogollon culture has been shaped by both Mogollon and Pueblo;
d) That the Mogollon culture represents an entirely new pattern.

The author takes the position that the Mogollon culture, in most of the cultural traits except pottery, is very like Basket Maker-Pueblo. In the matter of pottery he is a little vague, and his terminology loose—in one place he stresses similarities of the Mogollon pottery with Pueblo and in another he points out striking differences.

In twenty-three traits which he lists, he points out that twenty-one are similar to Basket Maker-Pueblo and nine are similar to Hohokam. The writer, considering Kayenta Branch, Marsh Pass and Black Mesa phases typical Basket Maker-Pueblo contemporaneous with Georgetown, the earliest Mogollon phase, recognized by Haury and Nesbitt, would reduce the twenty-one

similarities with Basket Maker-Pueblo to fourteen. We feel that the so-called Pueblo II in the Flagstaff area is not Pueblo at all and Kiatuthlanna is only partly Pueblo.

The distinctive early Mogollon traits are very few. The most distinctive complex of traits include:

1) Pottery, one type is finely tempered, highly polished and fired in an oxidizing atmosphere. A group of types which Nesbitt calls "textured," and which show a tendency toward surface treatment by indenting, tooling, and scoring of plain pottery in design elements. Corrugated wares, as found in the Basket Maker-Pueblo culture, and fired in a reducing atmosphere are not found in this culture. The early Mogollon pottery is far better pottery, technically, than was that made by their contemporary neighbors in the Hohokam or Pueblo.

2) Grooved awls.

3) Single post, deep earth lodges with a side entrance.

Almost all the other traits are similar to Basket Maker-Pueblo.

Nesbitt excavated four pit houses which he considered to be Georgetown phase, the rest that he excavated belonged to the later San Francisco phase which showed more Pueblo characters. He points out the fact that Pueblo influence becomes stronger and stronger during the time in which the Starkweather site was occupied. To throw light on the Mogollon we must look to the Georgetown phase.

In general he feels that the Mogollon culture is of a generalized Southwestern character and that the methods of making polished or textured pottery came from some area as yet unknown, and reached the San Francisco at some time not earlier than 700 A.D. The Mogollon sherds found intrusive in the earliest levels at Snaketown he thinks came from this same still unknown source. This is unlikely because, 25% of the 13,000 sherds in Haury's dig were highly polished San Francisco Red, a proportion which any archaeologist would interpret as meaning that the type was indigenous, while but a total of eleven sherds of this type were found in the whole Pioneer stage of four phases at Snaketown. This would indicate that the sherds came from another source.

If the dates for the Hohokam Pioneer stage are as early as Gladwin considers, Nesbitt is right in claiming that the San Francisco Red sherds could not have come from the drainage of the Mimbres or the San Francisco; all the dates so far determined lie in the late eight hundreds. However, the Georgetown phase, which is earlier than the dated San Francisco Phase, is as yet undated. Sayles is reported to have pre-Georgetown material in southeastern Arizona. So the Mogollon Problem is still unsolved.

Those of us working on the archaeology of Arizona recognize a series of cultures (branches) that extend through the mountain country between the southern desert and the plateau, extending from the San Francisco Mountains in Arizona to the Mimbres River in New Mexico, whose ceramic roots seem to

lead to the same trunk. The culture complexes previous to 700 A.D. were neither like the Pueblo of the plateau nor like the Hohokam of the desert. They are something else, and to distinguish the culture of these mountaineers from more virile cultures of the plateau or the desert, we feel that the conception of Mogollon is useful. At the present state of our knowledge the Mogollon is a hypothesis, but a hypothesis necessary for an understanding of the history of the Southwest.

HAROLD S. COLTON
Flagstaff, Arizona

The Pottery of Santo Domingo Pueblo, a Detailed Study of its Decoration. KENNETH M. CHAPMAN. (Memoirs of the Laboratory of Anthropology, Vol. I, 192 pages, 34 text figures, 79 plates of which 72 are in color. Santa Fe, 1936, issued December, 1938.)

Most welcome to all students of Southwestern archaeology and of especial value to ethnologists interested in the development of primitive art, is Mr. Chapman's excellent book upon the pottery of Santo Domingo Pueblo. It represents the first inclusive study, so far put into print, of the ceramic decoration of any modern pueblo.

Mr. Chapman began his study of the decorative art of Santo Domingo pottery in 1920. From the start, he was handicapped by the rarity of existing specimens and the fact that material was rapidly approaching extinction. Nevertheless, through persistent and tactful searching in pueblos, museums, and curio shops a total of more than a thousand decorated specimens were collected for the study.

The book opens with a brief historical sketch of Santo Domingo Pueblo; this is followed by an outline of pre-Spanish and post-Spanish pottery types. Pottery wares and their relation to antecedent types and genealogical progenitors are discussed in the following order: Culinary wares, Black-on-cream ware (by far the most abundant), Black-on-red ware, Black-and-red-on-cream ware and Polished wares. Processes of technology, slipping and polishing, painting, and decoration are included.

Black-on-cream ware is described in detail and its development postulated. The history of this ware is incomplete, due to lack of accurately dated vessels, but it is Chapman's belief that the creamy slip has been derived from a similar slip used in late phases of pre-Spanish glazed ware. Santo Domingo wares are not, however, thought to be directly derived from any one of the three distinctive pre-Spanish types. Chapman believes that it would be impossible to assign an age greater than 100 years to any of the wares, although certain storage jars may be much older.

Pleasingly handled is the section treating decoration, elements of design, motifs, and their arrangements. Numerous text figures and 72 well annotated color plates supplement the description, making the volume valuable and in-

teresting to the layman as well as the professional. While in decoration a certain amount of freedom in individual taste is permitted, the potter is limited by socially inherited decorative technique and . . . "by conforming with the conventions of a gradually evolving system of decoration sanctioned by long usage."

It is hoped that Chapman's admirably ordered and fully presented study of Santo Domingo pottery types will serve as a model for like studies of the ceramics of other modern pueblos. The book is carefully edited and to this reviewer the data presented is without fault. No student of the Southwestern field can afford to neglect this stimulating volume by one so broadly experienced in Southwestern ceramics.

PAUL H. NESBITT
Beloit College

The Rain Bird, A Study in Pueblo Design. H. P. MERA. (Memoirs of the Laboratory of Anthropology, Vol. II, 113 pages, 48 plates of which 26 are in color. Santa Fe, 1937, issued December, 1938.)

In view of the deficiency of design analysis of Pueblo pottery, Mr. Mera's monograph is a welcome contribution to Southwestern literature. It is based on the study of a well known and frequently used design occurring on Zuni water jars, which, according to popular usage, is designated the "Rain Bird."

The present report opens with a brief statement concerning the "Rain Bird" and its distribution and a short but inclusive section demonstrating its probable origin from prehistoric pottery designs. This is followed by a description and analysis of the "Rain Bird" design among the following historic pueblos: Zuni, Hopi, Acoma, Laguna, Tsia, Santa Ana, San Ildefonso, Tesuque, Cochiti and Santo Domingo. In its numerous forms the Zuni "Rain Bird" spread to most of the now existing pottery-making pueblos. In these it was either adopted or adapted, often both.

It is Mera's belief that the so-called "Rain Bird" was largely derived from a specialized form of interlocking scroll. As this feature appears on the Tularosa Black-on-white from the Upper Gila district, he sees in this pottery designs parental in form to the "Rain Bird." Graphic forms indirectly connecting Tularosa Black-on-white geometric designs and bird-like figures are thought to be Mesa Verde Black-on-white, Four-Mile Polychrome and Jeddito Black-on-yellow.

The reviewer is in doubt as to Mera's correctness in thinking that the people of the Tularosa culture were ancestral to those of Zuni (p. 4). Evidence presented does not warrant such a broad statement. Nor, until more exhaustive studies have been made, can we accept the premise that progression has been from Tularosa Black-on-white geometric design to that of the "Rain Bird." To this reviewer there are altogether too few traces found of the survival of typical Tularosa motifs.

The manuscript is carefully edited and printed in easily readable type on ivory paper. The plates, drawn by Tom Lea, supplement the text, and are fully annotated.

The value of the report lies in its excellent analysis of the "Rain Bird" design and its clear presentation of data which raise new problems deserving of more detailed investigation. Presentation in published form was made possible through funds provided by the American Council of Learned Societies.

PAUL H. NESBITT
Beloit College

Picture-Writing of the Texas Indians. A. T. JACKSON. (Anthropological Papers, Volume II. Bureau of Research in the Social Sciences, Study No. 27. The University of Texas Publication No. 3809, Austin, March 1, 1938.)

In order to understand better the relative importance of this new book and its place in the literature of Indian pictographs it may not be inopportune to consider briefly the historical sequence of the studies on this subject. There seem to have been two more or less distinct periods of interest in Indian pictographs, both of which witnessed general as well as areal studies. In the older series are Bruff's studies of the petroglyphs of the Nevada Range, Green's *Rock Inscriptions of Johnson County, Arkansas*,[505] and especially the masterly memoirs of Garrick Mallery.[506] These general studies, pretending to cover the entire subject before detailed field work was done, left large areas without proper consideration—a condition that the more recent studies remedy, since they include less philosophy but more actual field work scientifically presented.

For more than a generation this secondary, yet interesting, culture manifestation seems to have been neglected by American archaeologists. Then came the work of Fewkes in the Southwest during the 90's and in Puerto Rico (1903), and that of Emmons in southeastern Alaska (1908). More than ten years later, Kidder and Guernsey published some pictographs from northeastern Arizona in Bulletin 65 of the Bureau of American Ethnology.

Then we have the more recent series, comprising valuable works on limited areas, including the work of Strong and Schenk,[507] Erwin,[508] Steward,[509] and Renaud.[510]

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[505] Published in the *Annual Report of the Smithsonian Institution* for 1872 and 1881, respectively.

[506] In the First, Fourth and Tenth *Annual Report of the Bureau of American Ethnology.*

[507] "Petroglyphs near the Dalles of the Columbia River." *American Anthropologist*, N.S., Vol. 27, 1925.

[508] "Indian Rock Writing in Idaho." Idaho State Historical Society, 1930.

[509] *Petroglyphs of California and Adjoining States.* UCPAAE, Vol. 24, No. 2, 1929. "Petroglyphs of the United States," Smithsonian Annual Report, 1936.

[510] Survey reports of the University of Denver cover Colorado in three reports (1931–32–33), Wyoming (1932), the High Western Plains (1936) and north central New Mexico (1938).

This brings us to the neighboring state of Texas, which was progressively surveyed, as shown by the work of Victor Smith,[511] Colonel Crimmins,[512] Jackson,[513] Woolsey,[514] Horne,[515] and Kirkland.[516]

Now comes Jackson's *Picture-Writing of the Texas Indians*, edited by the late Dr. J. E. Pearce, an excellent work which crowns several years of painstaking research, completing and systematizing the results already obtained by the author and other writers, and placing Texas by the side of the other western states as having a wealth of recorded and published Indian pictographs. It is a valuable contribution to American archaeology and the study of aboriginal art.

I wonder why the author, who has well defined and correctly used the terms "pictograph" and "petroglyph" has chosen for the title of his book, and has frequently repeated in it, the more popular, vague, and not entirely correct expression "picture-writing"?

Following a short "Editor's Note" by Pearce and acknowledgments to numerous persons who assisted the author in his long task comes a worth-while "Introduction," giving information as to the number and distribution of sites with pictographs, and as to the types. In this connection, would it not be more precise to use the term "incised" or "graved" instead of "carved" to describe this class?

The book is divided into nine parts of uneven length and importance. By far the most important is Part I, covering some 310 pages, which presents a systematic inventory and descriptive catalogue of "Rock Pictures on Bluffs, Cave Walls and Boulders." It is profusely illustrated by photographs and line drawings of features which, by reason of position, light, degree of preservation, or other consideration, are not fit subjects for photography. There are also some views of the sites, and a few full-page colored plates of scenes or pictographs of particular interest. This is, of course, the best way of giving the reader a more vivid and exact idea of the actual appearance of these aboriginal paintings. Among them may be mentioned a hunting scene from Val Verde County recalling similar pictographs from rock shelters of eastern Spain and Bushman

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[511] His work covers the Big Bend region and is treated in papers in the *Publications of Texas Folk-Lore Society*, *American Anthropologist*, and *Texas Archeological and Paleontological Society*.

[512] In *Art and Archaeology* (1926), *West Texas Historical and Scientific Society*, Publication No. 2, and *Texas Archeological and Paleontological Society* (1929–30–31).

[513] *Field Reports on Pictograph and Petroglyph Sites in West Texas*. The University of Texas Anthropology Museum, Austin, 1930–37.

[514] *Field Reports on Pictograph and Petroglyph Sites*. The University of Texas Anthropology Museum, Austin, 1936.

[515] "Petroglyphs, Tonk Creek." *Central Texas Archeological Society*, Vol. I, Waco, 1935.

[516] "A Study of Indian Pictures in Texas," *Texas Archaeological and Paleontological Society*, Vol. IX, Abilene, 1937; "A Comparison of Texas Indian Pictographs with Paleolithic Paintings in Europe," *Central Texas Archeologist*, Waco, 1937.

painting from South Africa, a large "Thunder Bird" in brownish red from Terrell County, and a strange human figure, ten feet tall, from Val Verde County.

Part II, only three pages long, deals with the doubtful category of tree drawings, of which Jackson says "there remains in Texas no known authentic case of Indian paintings or carvings on trees." Part III, in the space of twenty-five pages, presents "Pictures on Movable Objects," proving that the author accepts, as I do, the broader definition of pictographs as being pictures made on any kind of material. A very short Part IV treats late and historic painting in two pages.

Then comes the important Part V, the most interesting for the general reader and especially for the student of pictographs, because it presents and discusses the "Classification and Distribution of Design Elements." The author shies away from the use of big scientific words that give a clear-cut classification, such as "anthropomorphic," "zoömorphic," and "skeuomorphic" with the proper subdivisions. All human figures are presented under the heading "Conventionalized Human Figures" and there is no sub-title for realistic human representations. It seems illogical to interrupt the orderly presentation of body forms and parts to insert headdresses and feather decorations between position of the arms and phallic representations and human hand and foot prints. The interesting group named "Mission and European Influences" is poorly subdivided (for "teepee," why not "tipi"?) since all could be grouped under the generic term "skeuomorphic." The sections dealing with "Lower Life" and "Other Forms of Life" could have been more systematically grouped under the heading "zoömorphic," with appropriate headings for mammals, birds, reptiles, and insects and subdivisions as needed. A more logical and scientific presentation would be more fitting for a subject relatively so complex and for a work otherwise so well done, and would permit a more ready comparison with similar studies of pictographs elsewhere. In spite of these minor criticisms, the work is of high quality.

The following three sections are treated very briefly. Part VI, covering materials and methods, suggests that various techniques may have been employed by different tribes. Part VII disposes of the important questions of age and authorship. The author lists six criteria such as any prudent and critical archaeologist would use in attempting this kind of work—some of them have been employed with success for the palaeolithic caves and rock-shelters of Europe. In treating the equally difficult problem of interpretation, in Part VIII, Jackson accepts the meaning of a few of the pictures as self-evident, and concedes that a satisfactory interpretation of all the rest of them is conjectural or even impossible. He has no illusions concerning the relative importance of most of the drawings, which are often trivial and without historical significance. Nevertheless in the eyes of the archaeologist who collected them they "are the first attempts at art in Texas. They reflect the customs, beliefs, superstitions,

longings, and accomplishments of a primitive early race. [The word 'Indians' would be better there.] . . . Their existence throws light on the processes of primitive mentality. . . . They are held now to be the earliest crude forms of writing, as well as the first forms of painting and sculpture." This may be true if the word "writing" is accorded its broadest meaning; as to sculpture, I do not recall any mention of it in the whole book—drawing, painting and engraving, yes, but no sculpture.

I agree with the author in asserting that comparisons of these expressions from various areas, and especially from adjoining regions, might bring to light data regarding migrations, culture contacts, or similarity in religion and the psychology of art. His comparison of rock pictures and pottery designs could be done elsewhere.

Although the conclusions, eleven numbered paragraphs in Part IX, cannot be reported, one will be quoted as giving a clear view of estimation of ages.

"The ages of the oldest pictographs may not go back further than 1500 years. Most of them appear to be much more recent. Perhaps the majority are not older than 500 years, with some not more than 100 years."

A good bibliography and index close the volume.

It is hoped that this review of Jackson's work, following the divisions of the book step by step, will give some idea of the extensive amount of field work done by the author, and of the systematic presentation of the results of his research. Text and illustrations are praiseworthy. It is a task well accomplished, and one that should serve as an inspiration to archaeologists to attempt the same thing in their respective regions or states.

E. B. RENAUD
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Uaxactun, Guatemala, Group E—1926–1931, Part I, the Excavations. O. G. RICKETSON, JR., *Part II, The Artifacts,* EDITH BAYLES RICKETSON, Appendices by MONROE AMSDEN, A. LEDYARD SMITH, H. E. D. POLLOCK. (Carnegie Institution of Washington, Publication 477, pp. xiii, 314, text figs. 198, pls. 88, Washington, 1937.)

Exploraciones en Oaxaca, A. CASO. (Instituto Panamericano de Geografia e Historia, Publication 34, pp. 96, figs. 107, pls. 5, maps 19, Tacubaya, D. F., Mexico, 1938.)

These two reports, describing the Ricketsons' work at the important Maya site of Uaxactun in the Peten district of Guatemala and Dr. Caso's excavations at Monte Alban are significant contributions to the complex field of Middle American archaeology. Each publication sets forth the content of prolonged research in major sites of highly developed cultural status. The more highly evolved the material remains, the more complicated the assemblage of the component parts becomes and the more arduous the task of recovery and interpre-

tation. These reports are each preliminary steps in the ultimate cultural and historical analysis of these two important centers, both of which represent long occupations. To the Ricketsons' report is added a survey by Dr. Ricketson, which reconstructs the ecological conditions under which Maya civilization waxed and waned.

Each site begins with a relatively primitive stage and passes into a long continued emphasis on the ceremonial and ritualistic factors so important in the high cultures of Middle America. At Uaxactun the early period is marked by ceramics, containing Q-complex forms and a plaster-covered platform decorated by masks disclosing a ceremonialized representation of a tiger. The site then assumes characteristic Peten Maya features including the longest run of dated monuments in the Maya area, architecture utilizing the corbel vault, and definitive Peten Maya ceramic forms and decorations. Monte Alban likewise begins with a ceramic showing Q-complex elements, albeit in totally different wares from Uaxactun, sculpture showing in some examples a curious affinity with the masks on the early temple at Uaxactun, and an archetype of the later Zapotec writing. Then Monte Alban settles down to a long occupation apparently without sudden change, and ends with a violent shift from Zapotec to Mixteca-Puebla religious symbols. An additional and highly suggestive factor is the presence of Teotihuacan culture elements at both sites.

The major problem affects the interrelationship of the earlier phases of the ceremonialized cultures, whether Peten Maya, Zapotec, and Teotihuacan had a contemporaneous evolution or whether they stood for successive phases of culture diffusion. Were there no hints of absolute time, a strong case could be made out for contemporaneity. However, the five and a half centuries of recorded dates at Uaxactun represent a long span of existence for a high culture and the possibility of overlapping stages becomes an important element in the analysis. The answers lie in the long tedious excavation of enormous sites, the architecture of which creates a strong local differential in the interpretation of ground conditions. Important as are the intellectual and historical aspects of Middle American archaeology, straight excavation has its very definite place and no better illustrations can be furnished than these two reports. Both Dr. Caso and the Ricketsons have opened a broad trail into the tangled jungles of Middle American archaeology.

G. C. VAILLANT
American Museum of Natural History

Battlefield of the Gods. Aspects of Mexican History, Art, and Exploration. PAL KELEMEN. With an Introduction by Professor ALFRED M. TOZZER. (212 pp., 61 pls., index. London: George Allen & Unwin Ltd., 1937.)

Professor Tozzer introduces Mr. Kelemen's work as "the reactions of an art-historian" who brings to bear upon the subject of Mexico "his intimate knowledge of art. . . . " It is very much to be regretted that the methods and

principles of art history, in their application to the materials of American archaeology, should have found such an inadequate exponent as this Hungarian writer. Spinden's monumental thesis, published in 1913, is the only extant evaluation of a Middle American art on historical principles. Since Spinden, stylistic method in European art history has acquired a precise vocabulary and has defined its concepts more closely. There exists, for instance, among professional art historians, a series of terms descriptive of spatial treatment in architecture. Their application to Maya architecture is of immediate importance: Mr. Kelemen, however, overlooks the factor of spatial enclosure *in toto*. For that matter, he repudiates the basic principle of his discipline, namely that of style as a historical phenomenon, by his categorical assertion that the regional individuality of the architecture makes it "impossible, in the absence of hieroglyphic dates, to date Maya cities by the type of building alone." Elsewhere, Mr. Kelemen contradicts this self-destructive postulate by describing certain buildings at Chichen Itza as "earlier" or "later" than others, presumably on hidden stylistic grounds, which he fails to elucidate.

The most elementary process of art history is an empirical one, consisting in the taxonomy of form in the work of art. Formal analysis is therefore indispensable to the concept of style as a frame of historical reference. Mr. Kelemen's study of the forms and their organization in American aboriginal art is, at the most charitable, incompetent. The significance of the "mosaic" façades of structures at Uxmal and Chichen Itza, as prefabricated, interchangeable, reusable elements, and as the sculptural realization of a masonry-veneer technique, escapes him entirely. His exposition of the theory of the Maya vault suffers both from oversimplification and from ignorance of easily-accessible recent studies. The chapter entitled "Analytic Light on Pre-Columbian Art" reduces to a check-list of obvious comparative terms between American archaeology and that of Europe and the Near East. An incongruous parallel is drawn between Gauguin and the anonymous muralist of the Temple of the Warriors, presumably in an effort to season the thin gruel of this chapter. Mr. Kelemen qualifies his work with the statement that it was written "in preparation for a forthcoming work to be occupied exclusively with the ancient art of the Western Hemisphere." The grandiose promise lacks collateral. The treatment of colonial art in Mexico reveals a singular lack of comprehension even of the European materials of art history. At Tlaxcala, for instance, the Moorish *artesonado* of the Franciscan establishment passes inspection as a "cedar ceiling," and the gateway arcade, with its Plateresque formulation, is described as "Romanesque." We learn that Mexico was "too late for Gothic," without any indication of the peculiar phenomena of survival associated with the persistence of the rib-vault and of medieval ornament in the religious establishments of Mexico prior to the Jesuit secularization of 1572. Mr. Kelemen employs the term "decadent" with reference to the occurrence of Christianity in Mexico, without realizing the subjective character of the exorcism he is uttering. His summary of the constitutive

elements of medieval style in Europe reveals handbook learning. It is probably expecting too many virtues from a work of this kind to demand principles and methods, but as an example of the cultured travelogue, it suffers by comparison with other specimens of that hasty art, such as Aldous Huxley's *Beyond the Mexique Bay*, Paul Morand's *Indian Air*, or Blair Niles' *Peruvian Pageant*.

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Ancient Man in North America. H. M. WORMINGTON. (Popular Series #4, Colorado Museum of Natural History, Denver. 1939. 80 pages, 13 illustrations, 30 cents.)

To transform what amounts to a technical discussion into a popular article, so that the layman can have the opportunity of looking at a picture of North American Prehistory of the earlier phase, is a difficult task at best. If the author is too technical the reader becomes bored looking up words with which he has little or no acquaintance. If written in too popular a style, the specialists descend upon the author from all directions, and the layman is apt to think it is a bed-time story.

To steer a middle course must be difficult, since one sees so few articles of this kind. Perhaps some of the science writers of the larger newspapers have achieved this happy state more efficiently than anyone else. Many of their articles on highly technical subjects are masterpieces of clearness and interest. In attempting to present this picture of Ancient Man in North America, Miss Wormington has also achieved this result to a marked degree.

It might have been better to have treated, in a separate paper, the more technical discussion of the realignment of the various types of Yuma points, since in a "popular series" this is apt to confuse the ordinary reader of such a publication. In fact, I am not sure that it is not somewhat confusing, even to those who are more or less familiar with the subject.

There is no question that it is important for someone to attempt to classify Yuma points by a more exact method than that so loosely followed at present, in which many types are included which do not belong in that classification. The same statement may apply, with less force, to Folsom artifacts. There are, without doubt, a number of types of points that do not conform to the definition of a Folsom point, which nevertheless may be part of the Folsom complex. A number of these, some of them with stems and other features that do not come within the definitions of a Folsom point, were found at Clovis. These particular artifacts were from the surface, though from the same parts of blow-outs as Folsom points, and while one cannot be sure, one wonders about the associations. Frankly there is not enough evidence yet to narrow down these finer phases of the problem. All the more reason, therefore, to have classifications submitted from time to time, such as this one of Miss Wormington's, since eventually a generally accepted classification will crystallize.

Miss Wormington covers descriptions of all the more recent discoveries in North America where there is any evidence of Early Man. Each case is well summarized, and, with the bibliography given, one can refer to publications describing these latest "finds." Furthermore, summaries of migration routes, time estimates, and racial types are briefly discussed, and at the end, one finds a glossary which forms part of the language (the most polite) used by those who have been making a study of the whole subject. Miss Wormington is to be congratulated upon her excellent summary of Ancient Man in North America.

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